The Northwestern Miller.

The Only Weekly Milling Newspaper Published in America.

VOLUME 8--NUMBER 9 | MINNEAPOLIS, MINN., AUGUST 29, 1879. | THREE DOLLARS PER YEAR

ST. ANTHONY FALLS.

A Historical Sketch of the Great Minneapolis Water Power.

[Written for Northwestern Miller, by F. E. Hesler.]
(Continued from last week.)

As a city increases in power, influence and wealth, the modest story of the past is relegated to musty and cob-webbed pigeon holes in the back part of the historical bump of some old settler. It is an astonishing fact, that in this city of over fifty thousand people, not one man in five thousand can give anything like accurate information upon the important transactions of the past—only by dint of the most violent exercise of the reportal pump applied to the "oldest inhabitant," has the writer been enabled to glean the following facts regarding the prominent epochs in the march of progress at the Falls of St. Anthony.

The reader was last week introduced to the infant whose growth was traced to its present herculean proportions.

Prior to the building of the present magnificent dam, Franklin Steele, in order to utilize the power, in 1848 built the dams mentioned in my last. The first was constructed from Hennepin Island, near its head, to the east bank of the river, and in order to hold the water back and form a penstock, was extended from the head of Hennepin Island to the foot of Nicollet Island. As these dams were considerably back of the verge of the falls and the old grist mill and saw mills were built directly over the dam, the full power was not utilized; only the fall from head water to the river bed below the dam being used. This gave but six feet head, while by going a few feet below, thirty to thirty-five feet might have been obtained.

Head of water, however, was not a factor in the calculation. Volume supplied power and as the little turbine with its mighty strength was not then known or little used, the horizontal wooden flutter wheel answered every purpose, but compared to the modern turbine was for speed and power, as the ancient Egyptian ox-cart to the modern "iron horse."

A few years served to show that the power on the west bank of the river was equally adapted to use, and could be made available by properly constructed works. Above the crest of the falls was a series of rapids down which the water rushed to the brink and thence to the gorge below over huge rocks—pieces of the river bed which had fallen from the ledge from time to time as the soft sand rock was washed out by the undertow below the fall, and which lay in inextricable confusion, piled one upon another. In order to govern the water and utilize the head, it was necessary to check the water and to make arrangements for raising and economizing the flow. The St. Anthony Falls Water Power company and the Minneapolis Mill company were chartered in 1853, within twenty four hours of each other, and at once began work upon the upper dam. Heavy timbers strongly tied and ballasted, were fastened to the bed rock near the centre of the river, forming a dam nearly one-third as wide as the channel. From this were constructed on either side, wings, the east side terminating on the old north and south dam of '48, and the west wing running to a bulk head constructed as the limit of the stock ponds for the west side saw mills. The immense pieces of rock were blasted out and removed from the foot of the fall, and the descent made as true as possible from the ledge down, then huge timbers were fitted in place and heavily planked, forming, on the western half, a perfect slide for the water, down which it ran, thus protecting the bed of the river and preventing further demolition of the lime stone ledge. This work remained intact until 1857. The memorable freshet in this year, which came so near doing untold damage, reached its height July 21st, and the water, gradually working its way under the slide or apron, wrenched the massive timbers from their moorings and sent them whirling down the torrent.

Two years later, April 15th, 1869, the spring freshet, bearing on its turbid bosom the solid ice from above, ripped out the east wing and came very near destroying the whole work. This was soon repaired, however, and in 1870 the present apron was put in place, and has since remained intact, subject only to the battering of the logs going over the falls and the ordinary wear of the current.

In 1864, Dr. S. H. Chute conceived the idea of tunneling the sand rock and forming a tail race for the purpose of utilizing the power under increased head. Accordingly, he at once began excavating an eight foot tunnel, piercing the sand stone just below the mineral springs on the east side. A straight opening was made for about two hundred feet where the tunnel turned and ran up the river about eight hundred or a thousand feet to the crest of the fall. It was the intention to carry water to the mills along a flume or canal, and let them discharge into this race, lining it with sheet iron or masonry. The purpose, however, has been temporarily abandoned, and the hole is at present utilized by an enterprising individual who carries passengers up "Chute's Cave" as it is called, in an old flat boat at ten cents per head. In order to get power for the Phœnix Mill, built in 1875, a tunnel was blasted in the river bed, which extends under the bank, perpendicular to the direction of the river, and a shaft sunk to communicate with this "cave." The water was thus taken directly from the river, and drawn to the wheel pit without the expense of building an extensive canal. A bulk head was thrown across the head of the old tunnel or "Chute's Cave," and a short race opened that so the waste water ran into the river just below the present fall.

Nicollet Island was originally owned by Franklin Steele, who sold the St. Anthony Falls Water Power company the entire right for mill powers surrounding the island. The property becoming involved, was transferred, respect being had for the mill powers as above, and W. W. Eastman and others becoming interested in the island as owners, the parties in interest became involved in a law suit to ascertain who were the actual owners of the water privileges along the property. Finally as a compromise, they relinquished all claim to the Water Power company in consideration of two hundred horse power upon the west side of the island, and near its lower point, the contract stipulating that they were to have an additional 50 horse power for the sum of $500 per year.

In order to utilize their power, in the summer of 1868 W. W. Eastman, John L. Merriman, A. H. Wilder and W. S. Judd began excavating for a tunnel at the foot of Hennepin Island. It was the intention to pierce the sand rock and run a tunnel from the foot of Hennepin Island, as a point of discharge, under the island and up to the mill site on Nicollet Island, where they had determined to erect their factories and mills. But their plans were ill matured, for they met with a disaster which came very near destroying the entire interests at the falls. Stipulations had passed between Eastman & Co. and the Water Power company, defining the rights of each party in the premises, and arrangements were entered into whereby the Tunnel company agreed to hold the Water Power company free of all damage. The work progressed finely until Oct. 2d of the following year, when they had reached a point about half way between the two islands. Richard Chute on this day, examining the condition of affairs, found the water oozing through the sides and roof of the tunnel and became somewhat alarmed. So nervous and uneasy was he that he slept scarcely any that night, feeling a presentment of danger, he informs us. The next day notice was formally served upon the excavators to cease further work until the proper precautions were taken to secure the safety of the river bed. No heed however was taken of the remonstrance, and Oct 4th, 1869, the grand catastrophe occurred. It had been noticed for several days that the water coming through the walls, when taken in the hand, left a deposit of sand and showed flakes of limestone. On the morning of the day above mentioned the usual crew were at work, when the sides of the tunnel next the channel began dropping in. Alarmed, they began to leave, when the water at their feet warned them to make haste. A perpendicular shaft had been sunk at the head of Hennepin Island, and up this the workmen climbed for safety, the water rushing about their knees as the last man reached the ladder. One man, fearing to await his turn at the ladder, ran for the mouth of the tunnel, was overtaken by the water and swept out into the river, and was saved almost by a miracle. The water had percolated through the limestone ledge, and working through had cut away the soft sand rock. It poured through the tunnel, making its way by fissures and seams, wearing a caverous opening in the lower stratum, and down went the limestone ledge, which forms the bed of the river, piling rocks and floating logs in indescribable confusion. Intense excitement was immediately aroused. The news spread like wild fire. "The falls are going out!" was the wild cry that echoed throughout the city. No time was lost in vain wailing. Ready hands rushed to the rescue. Logs, bales of hay, bags of sand, dirt, anything and everything to be obtained was hurled into the boiling abyss and still the angry waters rushed through the luckless opening. Plainly time was being lost. The hole was increasing in size and effective measures were of vital necessity. Willing volunteers sprang to the call and a coffer-dam hastily thrown about the opening, finally offered an opposing bulwark to the encroaching stream and the danger was temporarily averted.

The protection, however, proved but temporary, for sixteen days later, October 20, a second break occurred, this time about half way between the two islands. The second break proved even more disastrious than the first, as the water washed out the lower portion of the island, carrying with it the mills noted in our former article. This break was finally controlled very much as had been the last one, and permanent works were put in to stop further damage. A feeling of partial security was enjoyed during the winter, but July 4th, of the next year, a third break occurred, this time in the east channel between Nicollet Island and the main land just below the bridge. The third catastrophe was circumvented in time and receiving government aid, the work for the preservation of the water power and for the perpetuation of navigation above the falls was inaugurated. Huge bulkheads were erected above and about the breaks. The openings were plugged with logs, rock and cement, and when all was made safe from present danger, a shaft was sunk on Hennepin Island, seventy feet in depth. From this was extended on either side tunnels reaching across both channels to the main banks, and under the lime rock. In order to restrain all further encroachments of the water a wall was constructed forty feet in height, six feet in thickness at the base and four feet at the top. This was made of broken stone, held together with hydraulic cement forming an adamantine wall supporting the bed of the river running entirely through the soft sandstone and resting on the solid rock below. Nearly one million dollars of private, municipal and government money was expended upon the entire work, and at last we have secured against all time one hundred and twenty thousand horse power, sufficient to grind all the wheat raised in the country tributary to Minneapolis for the next hundred years.

The low stage of water which has prevailed for the past two years will not in future prove so troublesome to our millers. Government engineers have made a survey of the head waters of the Mississippi river

Continued on Page 140.

THE NORTHWESTERN MILLER.

Published Weekly at $3.00 Per Year.

OSTRANDER, HOPPIN & DEAN, Publishers,

219 Washington Ave. South.

MINNEAPOLIS, - - - MINN.

Entered at the postoffice in Minneapolis, Minn., as second class matter.

Notice to Our Readers.

The columns of THE NORTHWESTERN MILLER are always open to *all* of its readers for the discussion of topics relating to milling. We solicit especially fresh news of fires, failures, new mill enterprises, etc., and always pay for the stamps and trouble.

OSTRANDER, HOPPIN & DEAN,
Minneapolis, Minn.

Our Club List.

In order to meet the wishes of some of our subscribers who have asked us to club our paper with some one or more of the leading Milling and Scientific papers we have arranged with a few of the most important papers. Others will be added to the list as asked for:

	Regular Price.	Club Price.
The Northwestern Miller with		
Scientific American	$6 20.	$5.20.
London Miller (monthly)	4.50.	3.50.
American Miller (monthly)	4.00.	3.25.
The Grain Cleaner (monthly)	4.00.	3.00.

Notice to Advertisers.

The NORTHWESTERN MILLER has double the circulation of any other milling journal published. It is a regular weekly visitor to a large number of the most enterprising and progressive millers and mill owners in the country. In addition to this, a large gratuitous circulation is sent out each week. We have lately made out new and complete lists of the millers, millwrights, etc. in the United States and Canada and shall send a copy of the NORTHWESTERN MILLER to each address at least once a month. *Our rates* of advertising are *lower according to the circulation than those of any other milling journal published.* Address, with copy of advertisement,

OSTRANDER, HOPPIN & DEAN,
Minneapolis, Minn.

ADVERTISERS' DIRECTORY.

NOTE.—Where Advertisements appear "every other week," or "once a month," a blank will be left in place of the page in those issues in which the advertisements do not appear.

Belting— Page.
Thos Bradford & Co
B. F. Gump 151
John James & Co. 146
O A Pray & Co. 149

Boiler Compound—
Lye & Zimerle 146

Bolting Cloth—
Thos Bradford & Co
Samuel Carey, New York 148
P S Crandall
J. R. Cross, Minneapolis 146
B. F. Gump 151
Howes, Babcock & Co, Silver Creek N Y 152
J E Huston & Co 146
John James & Co, La Crosse 146
O A Pray & Co, Minneapolis 149
Russell & Willford 147

Bran Dusters—
C. Rakes 151
Wm Richmond, Lockport, N Y 149

Brush Machines—
Barnard & Leas Mf'g Co. Moline 152
Eureka Manufacturing Co 150
Howes, Babcock & Co. 152
Wm Richmond 149

Coil Springs for Mill Spindles—
John A. Hafner 152

Conveyors, etc.,—
N. Hawkins & Co. 146

Corundum Tool—
Horace Deal 146
Teter & Allen 149
Weed & Co, Dayton, O. 147

Diamond Buhr Dressers—
Benton Buhr Dresser Co, La Crosse 146
Thos McFeely, Union City, Ind 151
Victor Bishop & Co. 149

Diamond Sharpener—
J. B. Harris, Ottawa, Ill 146

Elevator Buckets—
B. F. Gump 151
N. Hawkins & Co. 146
T. F. Rowland 143

Engines, Boilers, etc.—
E. P. Allis & Co. 152
Atlas Engine Works, Indianapolis, Ind 152
Great Western Manf'g Co 151
James Leffel & Co. 149
Poole & Hunt 148
Skinner & Wood 149

Feed Water Heater—
Stillwell & Bierce Mf'g company, Dayton

Flour Packers—
Barnard & Leas, Moline, Ill 152

Flour Triers—
H. J. Deal 147

Grain Weigher and Register—
Dr W H Allen 152

Insurance—
Iowa Millers' Insurance Co. 147

Iron and Porcelain Rolls, Middlings Crushers, etc.—
E P Allis & Co. 152
J. R. Cross, Minneapolis 146
Throop Grain Cleaner Co. 149
O A Pray & Co. 149

Mill Dress—
J W Truax 147

Mill Furnishers—
E P Allis & Co, Milwaukee 152
Thos Bradford & Co
Great Western Manf'g Co. 151
B. F. Gump 151
J E Huston & Co. 146
John James & Co. 146
A H Kirk 148
Munson Bros, Utica, N Y
J T Noye & Sons, Buffalo
O A Pray & Co, Minneapolis 149
Richmond City Mill Works
Russell & Willford 147
Williams & Orton Mf'g Co 152

Mill Picks—
John C Higgins, Chicago 146

Mill Stone Drivers and Bails—
J C Dane 149
Craik Turbine Mf'g Co, La Crosse 151
Sergeant Mill Buhr Driving Co 146

Mill Stones—
Thos Bradford & Co
Samuel Carey, New York 148
J. R. Cross, Minneapolis 146
Munson Bros, Utica
J T Noye & Son, Buffalo
Richmond City Mill Works

Mill Stone Ventilation—
J. R. Cross, } 146
W. de la Barre, }

Millwrights—
J. R. Cross 146
A H Kirk 148

Miscellaneous—
W Giles, Chicago, Ill 148
Lidgerwood Manufacturing Co. 148
Lord Bros 148
Nicollet House 148
Ferd Schumacher 149
Geo. Walker 146

New Process Mill—
Jas. Jones 149

Portable Mills—
Thos Bradford & Co
B. F. Gump 151
Chas. Kaestner
Munson Bros, Utica

Pulleys, Shafting, etc.—
John T Noye & Son
Poo'e & Hunt 148
Richmond City Mill Works
Williams & Orton Mf'g Co. 152

Purifiers—
Collins & Gathmann, Chicago 147
Fender & Cuthbertson
Reel & Seyler, Cedarville, Ill
Russell & Willford 147
Geo. T. Smith Middlings Purifying Co. 151
A N Wolf, Allentown, Pa 148

Purifying and Rebolting—
Andrew Hunter 139 & 143

Railways—
Chicago, Milwaukee & St. Paul 148
Chicago & Northwestern 148
Chicago, St. Paul & Minneapolis 148
Railway Time Tables 148
St. Louis, Minneapolis and St. Paul 148

Smut and Separating Machines—
Barnard & Leas Mf'g Co, Moline 152
Thos Bradford & Co
Howes, Babcock & Co. 152
J E Huston & Co 146
C. Rakes 151
Throop Grain Cleaner Co. 149
Wm Richmond, Lockport, N Y 149

Special Notices—
Eureka Manf'g Co. 146
Griscom & Co 146
"Miller," care Ostrander, Hoppin & Dean 143

Water Wheels—
N. F. Burnham 152
Craik Turbine Mf'g company, La Crosse 151
James Leffel & Co, Springfield, Ohio 147
Poole & Hunt 148
Poole & Hunt
O A Pray & Co, Minneapolis 149
Stillwell & Bierce Mf'g Co, Dayton, Ohio 147
Thompson Iron Works 148
J W Truax 147

Wheat Heaters—
J W Birdwell 143
A B Bowman 146
Gratiot Bros, Platteville, Wis. 152
Geo. W. McNeil, Akron, O 146
O A Pray & Co. 149

Wire Rope Transmission—
Williams & Orton Mf'g Co. 152

ONE of our subscribers wishes to know where he can obtain some Treadwell wheat for seed. Will some of our Michigan readers give the desired information?

J. B. HARRIS, of Ottawa, Ill., has been manufacturing stone dressing machines ever since we can remember, and every little while brings out a new one. Two of his latest machines are illustrated on page 140 of this issue. Having become immensely wealthy out of the stone dresser trade ourselves, we wish friend Harris the same happy success.

HAVING perfected all their arrangements for the manufacture of their new specialty, the "Silver Creek" flour packer, Messrs. Howes, Babcock & Co. are now ready to fill all orders for flour packers, and attention is invited to the change in their advertisement and the cut of the "Silver Creek" packer shown therein. This well known firm has long had the reputation of turning out nothing but the very best workmanship in their machines. This of itself is a guarantee that their new packer will be well and handsomely made.

THE details of the early history of milling in this city, of which we published the first installment last week, and the second chapter of which appears in this issue, will be found very interesting, especially to those of our readers who were acquainted with the early efforts to improve the water power on the west side of the river. As an item in the early history of milling at the "falls," Jno. T. Ames, of Northfield, remarked to us last evening, that he had shipped wheat from Rock Island and other down river points to St. Paul, and then hauled it overland to this city, to the Island mill, where Capt. John Rollins made it into flour.

WE shall be pleased if every miller who can possibly get away from his business long enough will come to this city next week to attend the great fair, the finishing preparations for which are now being made. Not only will there be a good display of mill machinery and milling products, but the various railroad lines will make special exhibits of the varieties of wheat, etc., grown on their lines. There will be a good display of agricultural products and a fine show of all kinds of machinery. Every effort is being put forth to make the exhibition even better this year than last. All visiting millers will be made welcome at the office of the NORTHWESTERN MILLER, on the fair grounds.

WE would call the attention of our readers to the change in the advertisement of Lye & Zimerle, Delphos, O., manufacturers of an improved anti-incrustation compound for steam boilers. The fact that these gentlemen have given the subject of incrustation in boilers their entire time and attention for nearly five years, should be evidence that they understand their business, and that their compound deserves the attention of all steam users. They warrant the compound to neutralize the fresh deposits of lime and other mineral, thus stopping new formations of scale and gradually bringing out the old. It is highly recommended by some of the largest steam users in the United States, and would no doubt prove beneficial to all who use hard water.

THE LEADING manufacturers of milling machinery are making extensive preparations for a creditable display of their wares at the coming exposition in this city. A large space in Machinery Hall has been reserved for this purpose, and millers and mill owners will find machinery on exhibition from the works of the following well known manufacturers:

O. A. Pray & Co., and the North Star Iron Works, Minneapolis; Howes, Babcock & Co., Silver Creek, N. Y.; Barnard & Leas Manufacturing Co., Moline, Ill.; Edwd. P. Allis & Co., Milwaukee; J. R. Cross, Minneapolis; Geo. T. Smith Middlings Purifier company, Jackson, Mich.; Cockle Separator Manufacturing company, Milwaukee; D. M. Richardson, Detroit, Mich. The Victor Heater company and B. W. Shaw, of Minneapolis, will exhibit wheat heaters, and J. Bierbauer, of Mankato, Minn., will exhibit a purifier. These are all the entries in this department up to date.

The NORTHWESTERN MILLER, in company with the *Saturday Evening Spectator* and *Farm and Home*, will have an office on the grounds where it will be happy to greet all its old friends and make new ones.

ONE of our Pennsylvania subscribers has been kind enough to send us a sample of this season's crop of the famous Fultz wheat, about which there has been so much controversy between the farmers and millers, and upon which so much abuse has been heaped by the latter. The sample sent us is considered by the sender to make a little stronger flour than last year's crop. Still the excess of starch when compared with hard spring or winter wheat is clearly noticeable, and we think that the charge made against this wheat that it is deficient in gluten is amply proved by the sample sent. The sample sent resembles in its starchy character the varieties of soft spring wheat which have caused so much trouble in this section. It is between a hard and a soft wheat, not quite so starchy as the Lost Nation, and very far from being as abundant in gluten as the Mediterranean or Fife wheats. We conclude from the looks of the sample before us, as well as from the samples of flour sent us, that the flour made from this wheat, carefully milled, is far superior to that made from our soft spring wheats, and much inferior in strength and good qualities to the flour made from hard wheat. It may be a notion of ours, but still we firmly believe that the more gluten and the less starch any flour contains, the more healthful will be the bread made from it. We should, therefore, be sorry to see the hard winter wheat supplanted by the Fultz, although the latter is certainly a plump and handsome variety of wheat.

Roller Milling.

In the *Corn Trade Journal* of Aug. 2d appears an article illustrating and describing a new system of roller milling invented or designed by Mr. Wegmann, the patentee of the porcelain roller mill. The description does not state exactly where Mr. Wegmann's system differs from other systems of gradual reduction, but it does give pretty clearly the *modus oper-*

andi of gradual reduction in which so many of our readers are interested.

The wheat after passing the cleaning machines is passed through a set of granulating rollers, and thence through a separating reel, where the product of the first granulation is separated into broken wheat, coarse middlings, fine middlings, and finished flour. The broken wheat from this first reduction is passed through a blast machine to free it from light impurities and then through another pair of granulating rollers and a second separating reel, the product being divided as before into broken wheat, coarse middlings, fine middlings and finished flour. The broken wheat from this second reduction is treated in the same manner, and so on through successive reductions, until finally nothing of any importance remains in the bran, which is then passed through a pair of bran regrinding rollers. From these rollers the stuff passes to separating reels and is separated into finished large bran, small bran, thirds (we suppose they would be called shorts or ship stuff in this country,) and finished bran flour. The number of different reductions varies according to the nature of the wheat being operated upon. Ordinarily three operations in Mr. Wegmann's system are sufficient, but if the grain is very hard or tough the reducing operations are extended as may be necessary.

The coarse and fine middlings from the different reductions are separately sent to different grading reels, from which they go to the purifiers which are clothed and adjusted for the different grades of middlings. From the purifiers the coarse middlings go to rollers turning at equal speed, and thence to bolting reels where the separation into tailings, fine middlings and finished flour is made. The fine middlings go through the same operation, only that the rollers have the differential speed. The tailings from these separations are passed through rollers with differential speed, and thence through bolting reels, being separated into finished thirds and finished flour.

The fine middlings from the last separation are similarly treated, the product being finished sharps (or shorts) and finished flour. It will be seen that at each stage of the operation some finished flour is made, and that it is at once removed from further handling. Also, that after each reduction the dirt and light particles of bran are removed from the broken wheat before any further operation. Only one thing is done at a time and each product is taken out as fast as it is finished.

Manufacturing and Trade Items.

Hill & Hill, of Sanborn, Ind., are enlarging their mill to a four-run new process mill. Nordyke & Marmon Co., of Indianapolis, Ind., furnish their work.

Foreman & Carter, of Browning, Mo., are building a three-run merchant mill with Atlas engine. The outfit is purchased of Nordyke & Marmon Co, of Indianapolis, Ind.

Local and Personal.

—Another large shipment of Victor Heaters to London, England, this week.

—It is said that Christian Bros. & Co.'s new mill has been christened the "Crown Roller Mill."

—Jno. T. Ames, of Northfield, spent Wednesday in this city. We expect him back next week to take in the races.

Russell & Willford shipped this week two more of their purifiers, making six in all, to the new mill at Chippewa Falls, Wis.

—Mr. J. V. DeLong, of this city, has been engaged to take charge of R. L. Frazee's mill at Pelican Lake, Becker county, Minn.

—A. G. Mowbray, of Winona, has been spending several days in this city. He will probably be here next week to take in the fair

—His Honor, J. Silas Leas, is in the city to remain over fair week. He is one of the best natured, happiest and jolliest old bachelors that we know of, and we are always glad to have him around.

—F. C. Patterson, (not "old Billy") one of the skirmish line of Barnard & Leas' great army, is in the city making arrangements at the fair grounds to show up some of their celebrated grain cleaning machinery.

—Russell, Hineline & Co. are overhauling the Model mill and placing it in order for the new crop. Several sets of rolls will be added to the equipment, and a new water wheel and draft tube are being put in.

—Next week, Messrs. Russell & Willford, mill builders of this city, will begin work on a new mill for Messrs. Philip Henk & Co., at Chaska, Minn. The mill will be 36x54 feet, three stories high above basement.

—We expect that D. C. Howes, the champion light weight of the age, will spend next week in this city, and in anticipation of his coming we have had an extra row of cast iron columns placed under the modest pine staircase which forms the only means of approach to our office.

—J. S. Oborn, one of our old time acquaintances, dropped in for a friendly chat with us the other day. He has made up his mind that the "glorious climate of California" is just what his system requires and is now on his way to that land of the setting sun to carve out his fortune. We wish him abundant success.

—The contract for the foundation of the new elevator in St. Paul was let on the 22d to Daniel Mullen. The building will be 212 feet in length, 88 feet in width and 125 feet high. The motive power will be furnished by two Corliss engines of 200 horse power. It is expected that the elevator will be ready for business by the first of December.

—S. Chamberlain, one of the "old reliable" employes of Messrs. Jno. T. Noye & Sons, made a flying visit to this city on Wednesday of this week. He dropped into our office just long enough to shake hands and inquire as to our prosperity, and then was off like a shot to take the home train. We hope next time he comes up here he will at least find time to stay over night.

—The Victor Heater company has sold heaters within the last few days to the following mills: A. E. Barclay, Morristown, Minn., eight run; R. D. Hubbard & Co., Mankato, Minn., twelve run; Everett & Ward, Waseca, Minn., three run; Gibbs & Wheelwright, Wamego, Kan., three run; M. A. Shamleffer & Co., Council Grove, Kan., three run; B. D. Sprague, Rushford, Minn., thirteen run.

The Burlington, Cedar Rapids and Northern Railroad company have leased their road to the Chicago and Northwestern.

Milling News Items.

The flouring mill at Hillsborough, Wis., is undergoing repairs.

The new mill at Rockport, Dakota, will start up in a few days.

Flour sells at $4.50 per hundred pounds at Keogh on the Yellowstone.

Charles Pigler of New Auburn, Minn., has supplied his mill with magnets.

J. A. Kimberly, of Neenah, Wis., has put a new bran cleaner into his mill.

Mr. Thos. Rickert, of Ellsworth, Wis., has leased the Rushville mills in Salem, Wis.

The mill at Sumner, Wis., is being cleaned up and put in order for the new season's business.

The propellor Japan took 3,750 barrels of flour and 15,000 bushels of wheat from Duluth on the 23d.

The Lawrence County Mills at Sumner, Ill., are running day and night to supply the demand for their flour.

James Cussons, proprietor of the Elmira flouring mill at Chatfield, Minn., has put in a set of chilled iron rolls.

Exports from Duluth on the 28th included 1,675 barrels of flour, 1,650 sacks of export flour and 15,400 bushels of wheat.

Three large wheat elevators are being built at Crookston, Minn., by Childs & Co., Barnes & Co. and Brown & Allen.

The Indiana *Farmer* says that Fultz wheat will be largely sown in that state this fall, on account of superior yield.

A correspondent of the Topeka *Weekly Capital* mentions a flouring mill as one of the urgent needs of Americus, Kansas.

Messrs. Everett & Ward, of Waseca, Minn., have dissolved partnership, Mr. Everett continuing the milling business.

On the 21st inst. the propellor, Manistee, took out 150 tons of flour and feed from Duluth and the Winslow carried 500 barrels of flour.

Knapp, Stout & Co.'s new mill and elevator at Rice Lake, Barron county, Wis., will be the largest in that section north of Menomonee.

Casper Moser's mill dam at Plum City, Wis., has been washed out for the second time lately, but is now repaired, and the mill running.

Hoyt, DeWolf & Co., proprietors of the flouring mill at Money Creek, Minn., have dissolved partnership. Mr. Hoyt becoming the owner of the mill.

Ketchum & Bro.'s elevator, with grain, and some other property, at Marengo, Iowa, was destroyed by fire on the 20th. Loss, $30,000; one-third insured.

Mr. Bear, of Whitehall, Trempeleau county, Wis., has a large force of men at work repairing his mill dam, and will soon be ready to begin work on the new crop.

Eilet's mill at Chaska, Minn., refitted by Messrs. Russell & Willford of this city, has started up. The Augusta, Minn., mill, built by the same contractors, has also started up.

Dowd & Co., of La Crosse, Wis., will enlarge their cooper shop to accommodate the increased business, which will result from the demands of the new White & Listman mill.

The St. Louis coopers who went to work on a promise of advanced prices, stopped again on learning that the proprietors of the working shops were supplying the idle shops with enough barrels to fill orders.

Messrs. Burroughs & Pierson are rebuilding their flouring mill at Flint Mich., which was recently destroyed by fire. In the meantime their mill at Hersey is doing its best to supply the demand for their flour.

A correspondent of the Chicago *Times*, writing from Oxford, Kas., says: "A splendid opportunity presents itself to some one to build a water mill at this point. The water has a fall of nine feet to one and one-half miles."

Since new wheat came into market last fall, the Stillwater mills, at Stillwater, Minn., have ground 338,125 bushels. The mill will be shut down for a few days, soon, to make changes in the machinery and prepare for another year's work.

The first consignment of this year's wheat was received by the New York Produce Exchange, on the 19th inst. One lot of 6,500 bushels of No. 2 Nebraska Spring wheat, averaging sixty pounds per bushel, was received by David Dows & Co., and sold to Jones & Co. of the New York mills, at $1.01¼.

"Smith & Proctor's mill started up again on Wednesday with bran new machinery in part, and gave excellent satisfaction to all concerned. But by the giving away of one of the "steps" supporting the immense water wheel everything was brought to a standstill on Friday morning. This, however, will cause but slight delay. The mill now, with its new and improved machinery, is one of the best in the west."—*Neenah, Wis., Gazette.*

Crop Notes.

In Swift county, Minn., some damage has been done to stacked grain by recent heavy showers.

As far as the wheat around Grand Forks, Dakota, has been threshed, it turns out from thirty-three to thirty-five bushels per acre, No. 1 hard.

The first car load of new wheat shipped over the Southern Minnesota road, was from Fountain, Minn., and graded No. 1 hard in Milwaukee.

In Rice and Goodhue counties, Minn., where threshing is in progress, the yield of wheat is not large, averaging only from twelve to fifteen bushels per acre, but the quality is excellent.

The wheat crop in Juneau county, Wis., proves, on threshing, to be rather above the average. The yield is large, in some cases from thirty to forty bushels per acre, and the quality excellent.

Industrial Notes.

Pittsburgh consumes one-fifth of all the pig iron made in the entire country.

A paper mill is soon to be built at Marinette, Wis., which will cost $40,000, and employ fifty men.

Paterson, N. J., has fifty-five silk mills, twenty-six of which are making dress silks. Another mill is being built.

Within the past two years Natchez has built a cotton factory, every dollar of the stock in which is owned by her own citizens, and which is yielding the very handsome return of nearly 20 per cent. on the investment.

STOP! STOP!! STOP!!!

PURCHASING

Middlings Purifiers

Until you send your address to Andrew Hunter, who will explain the reason why and show you how to save from $50 to $300 on the purchase of each machine. "A dollar saved is a dollar earned." Members and those who are not members of the Millers' National Association will hereafter reap the benefit of the decision. Said decision prompted Hunter to reconstruct and simplify his machine, placing it outside of all possibility of infringement from reissues of old patents or any invention in use. Hunter has had the good fortune in simplifying his machine to enable him to compete in price with the poorest machine on the market. Hunter's purifiers are fully protected by his own patents, he having spent the past 18 years experimenting on machines for separating by specific gravity. He owns now over 15 patents, which cover fully all the principles used in his machines. Consequently there is no necessity of purchasing a license, or bolstering up with the aid of old patents or reissues. He guarantees better work and greater capacity than any machine in the world.

ANDREW HUNTER,
471 West Washington St.,
Chicago, Ill

Continued from Page 137.

about Pokegema Falls and vicinity and have submitted estimates for the construction of dams and reservoirs so that the spring floods may be held in check and an even flow of water secured. They estimate that this will give an average stage of two feet at St. Paul, above low water mark the year round, so that the largest packets may land in safety.

It takes no wise mathematician to solve the problem of the destiny of our beautiful city. The simple facts are potent to the most trivial mind. Our great fields lie spread out upon the western horizon, yielding the best wheat under the sun; our reputation is world-wide for the excellency of our manufactures, and our water power has been but barely touched—fully eight-tenths remain unused. Of the progress made upon the west side, the gigantic mills, our second disaster, and the marked era of improvement in the manufacture of flour, it will be the writer's purpose to speak in another article.

(Continued next week.)

Winter Wheat for Southern Minnesota.

The *Pioneer Press* in its agricultural department advocates the substitution of winter for spring wheat in the southern part of this state, giving the following reasons:

The southern part of this state seems to be growing less and less a wheat producing section. For the past two years it has suffered severely from blight, while there really has not been but one good wheat crop there in several years. Last year there seemed to be a section which might be said to be bounded on the north by the Winona and St. Peter road, or above, and on the south by the Illinois Central in Iowa, where the wheat was almost entirely ruined by the blight. This year, this same section is not much better. It seems to lie between the real corn belt and the real wheat belt, and to be admirably adapted for neither crop. The wheat appears to be in the milk just at the time when severe storms and hot suns are the rule, and to come out badly scathed. Even compared with the latitude of Minneapolis there seems to be a great difference in the latter's favor—not nearly so much damage resulting from the same causes, while farther up it grows less and less, until in the Red River valley it ceases to be a source of evil altogether.

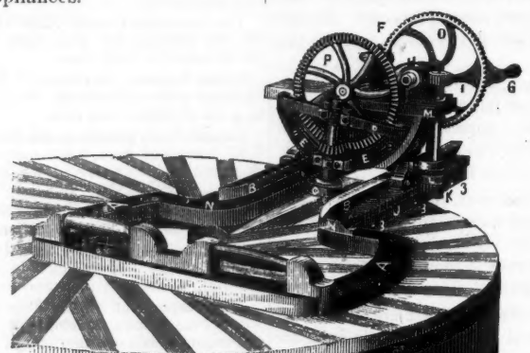
Now we wish to suggest winter wheat as a crop in this section. With some pains it is grown in certain localities here every year, while it might be made a general crop with but very little trouble. The only obstacle in the way of its growth is winter killing it, and this might be obviated by spreading straw over the ground after it is frozen. One man ought to cover two or three acres a day, and possibly might more, and once on the ground it would not only answer as a mulch, but also be rotted and ready for turning under the next year. As we remarked, in some parts of the state where the soils are light, it has been grown without difficulty for several years, and while it might find no market in Minneapolis, it certainly would in Chicago. The crop this year in Illinois and Michigan, notwithstanding the early unfavorable reports, turned out well, and in some cases the yields were phenomenal. Prices have been good and a stimulus given to the business that will lead to the sowing of a large area another year. Cannot its culture form a part of our farming in the section named?

The Indians are said to be starving in the British Northwest Territory.

Harris' Diamond Mill Stone Dressing Machines.

The successful execution of the various processes of milling depends in a very great measure upon the care and skill exercised in the dressing of the mill stone.

Progressive millers who wish to produce the finest grades of flour must "begin at the beginning." And the time bestowed upon the proper preparation of the buhrs for *their* work is by no means wasted. This duty is not a fitting one to be deputed to inexperienced hands, or improper appliances.



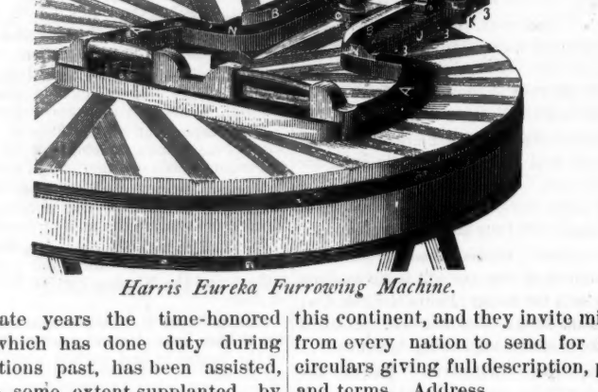
Harris Eureka Furrowing Machine.

Of late years the time-honored pick, which has done duty during generations past, has been assisted, and to some extent supplanted, by mechanical appliances, in which the use of the diamond has played an important part. The diamond has been in use for cracking and facing mill stones for about twenty-three years, and many machines of more or less merit have been introduced. The latest, and probably the most perfect and practical, being those which are herewith illustrated.

By reference to the accompanying cuts, it will be seen that one of our machines is for furrowing and the other for cracking and facing the buhrs, both of which are claimed to be far in advance of anything yet produced. The principles embraced in the "Eureka Furrowing" machine are entirely new, and cannot fail to commend the machine to every intelligent miller. The machine employs one or more revolving diamond cutters which are run at a speed of about three thousand revolutions per minute, making one hundred and twenty-five cuts to the inch the entire width of furrow, leaving the natural grit of the buhr, and the furrow perfectly true and smooth. Provision is made for dressing the furrows in buhrs that run either with or against the sun, and at any angle or pitch of furrow required.

The improvements made in the "I. X. L. Diamond Cracking and Facing machine" consist principally of the automatic feed, which can be set to cut any number of cracks to the inch from 8 to 125. The manufacturers and proprietors of these machines are confident they can supply millers with the best and cheapest cracking, facing and furrowing machines made on this continent, and they invite millers from every nation to send for their circulars giving full description, price and terms. Address

J. B. HARRIS & Co.,
Cor. Clinton and Washington St's.,
Ottawa, Ill.. U. S. A.



Harris Improved I. X. L. Diamond Cracking and Facing Machine.

Obeying Orders.

He was weeping softly as he came out to join his companions; a peculiar twitching of his muscles, and the careful manner of his gait were painfully apparent to the boys; they knew that he had been there and understood the whole business.

"Been gettin' a licken' Ben?" asked several sympathetically.

"Yes," murmured he, "I got licked fur obeyin' orders."

"Dis-obeyin," you mean cried they.

"No, fur obeyin, I tell you," persisted he; then, seeing their looks of incredulity, he made this explanation: "When I were comin' into the house my boots were muddy as blazes, and mother had been scrubbin' the floor; says she, "Now Ben, yoo'd better walk right over that clean floor with yer muddy boots." "Anything to oblige you, says I. So I boldly walked across the room, and she lit on me with a bound like a cat on a mouse, and the way she toted me around that room was a caution. I won't obey orders any more."

Footprints of Inventors.

If we could drop out of the mind the mechanical world of the present and have the world of 100 years ago revealed to us, a vast and comparatively trackless plain would represent the industrial condition of the time. The only footprints visible are the shadowy ones of the geniuses of the day, searching for the connecting link between mind and matter. Coping with the material difficulties and laying aside all personal considerations, these footprints in the sand become more distinct as time approaches the present, until they become the footholds of progress, the beaten track which has led modern inventors to the apotheosis of mechanical ingenuity. The world would have existed without the inventor, a weakly, sickly world, Hamlet, with the part of Hamlet omitted. The elements of nature held in abeyance, awaiting the inventor's wand, would have rusted in oblivion, if poverty, toil and persecution had driven the inventive genius of man from the field. The element of light latent in a multitude of substances came forth obedient to the command of an inventor, and found a foothold toward progress in the lucifer match. The means of creating light called forth the inventor who could find a use for the application of that element, and illuminating facilities have developed into the brilliancy of the sun through the medium of that fearful power, electricity. And this is only a small portion of the inventive progress of man. Through all of the various gradations of progress, from the faint footsteps of the early inventor to the steady, heavy tread of the modern inventor, each one has established a foothold for the progressive discoveries of him who came next in the order of time, until it would seem as if perfection had been attained, but still the dim outline of future possibilities point the inventor incessantly to renewed exertions in solving the mysteries of the elements and in gratifying the never-ending demands of progressive humanity.—*Mining and Scientific Press.*

Oregon Wheat.

The *Willamette Farmer* of August 8, says a great calamity has fallen upon the farming interests of western Oregon in the rusting of spring wheat from the Columbia river to the California line and in a manner never before known there, and that much of the crop, it is found, will be severely damaged, and some of it entirely ruined; but adds: that it is claimed by men used to rust in California that the worst of the fields will still be worth cutting, and that most of them will make a fair crop. Mr. Wilkins, president of the State Agricultural Society, is reported as expressing similar views, and as feeling confident that the harvest will not be seriously impaired.

In summing up it says: "The late spring sowing was due to continued rains through March and April, which brings the growing season in such cases to the last of July, whereas, if the grain had been sown in February, March and April, it would have all been ahead of danger and so advanced that the sun of July would have no such disastrous effect; owing to the heavy rains all the winter and spring, farmers sowed spring wheat a month later than usual, so that it is growing vigorously at a time when it ought to ripen. The acreage the present season is much larger than ever before, yet if the yield is equal to last year, farmers will be fortunate.

The St. Paul, Minneapolis & Manitoba branch road from Fisher's Landing is nearly completed to Grand Forks, Dakota.

THE HESSIAN FLY.

BY F. E. SKEELS.

Recent experiments by Prof. C. L. Ingersoll of the Michigan Agricultural College.

In 1875 the college was presented with some Asiatic wheat of a tender variety. This wheat was sown and the first year produced but seven and one half bushels per acre, while other varieties did much better in the same field. This wheat was again sown in 1876 and yielded seventeen bushels while Arnold Gold Medal in the same field gave thirty-five bushels per acre. It was determined to give it another trial hoping to produce a hardy variety, by continued sowing, and a valuable acquisition to our list of white wheats. At the same time, with the same cultivation, in the same field were sown several plats with other varieties of wheat. The Asiatic wheat bounded these plats upon two sides. The plats were sown in four drills, eight inches apart and thirty feet long, a path four feet in width running around each plat. These plats were closely watched by the students, for whose benefit they were sown. The soil was rather light loam underlaid by a stratum of hard blue clay. The flies made terrible havoc in the Asiatic wheat, and it will at once be seen that the plats were in an admirable place for experimental results. The soil, too, was their favorite choice. October first the Asiatic wheat was equal in appearance to any on the farm, and before October 26th the Hessian fly had destroyed fifty per cent of this wheat in many places; but new shoots were springing from stools not taken off below the crown and November 26th, the last fall observation, the wheat showed great improvement but the young shoots were not strong, while the fly in the flax seed state was found in nearly every stool. April 5th, the field showed much more improvement with the wheat growing well, what there was of it, for there were many places eighteen inches long in the drills where there was not a plant to be found. May 30th, several heads of smut were found; June 4th large quantities of smut were observed as were also great numbers of the larvae of the Hessian Fly; thirty-one of thirty-eight stalks being infested, in a single stool. All smut heads had suffered from the fly, one stalk contained fifteen larvae and one hundred and three were found in a single stool. July 10th, the field was harvested and over fifty per cent. of the wheat which was left in the spring was found cut down by the fly, the crop not being one-fourth. We thus find that the experimental plats were side by side with a field in which three-fourths of the wheat was destroyed; in no case were the plats over forty feet from the infested field. Field crops of the Gold Medal, Treadwell and Clawson wheats were also raised on the farm. The Gold Medal suffered in the fall twenty-five per cent. The Treadwell thirty-five per cent., while no trace of the pest could be found in the Clawson. Allowance must be made however in the case of the Gold Medal and Treadwell, for they were sown upon a clay knoll which had grown wheat the previous year, the object being to prepare the knoll for lawn. From the experimental plats, results were obtained which are found in the compiled columns below. It should be borne in mind that these plats received exactly the same cultivation and care as did the Asiatic wheat which suffered so badly. The first column shows the per cent. destroyed as observed and computed November 25th, 1877, the year the wheat was sown. The second column shows the number of Hessian Fly larvae found upon thirty stalks taken from three different places in each plat, as observed June 14th, 1878. The third column shows the weight, in ounces, of the products of each variety of wheat. The ground upon which these plats were situated was not of a kind to produce best results in wheat growing. An ounce and a half of wheat was sown of each variety.

VARIETY	Per cent destroyed Nov 25th	Larvæ on 30 stalks June 14th	Yield in ozs fr'm 1½ oz.
Asiatic	55		
Red May	70	30	3
Mediterranean	18	5	47
Louisiana	70	209	11
Kentucky	40	68	28½
Tappphannock	35	58	19
Shumaker	5	1	72
Post	2	42	17
White Rodgers	20	59	20½
Silver Chaff	20	49	30
Victoria	45	136	3
Amber	5	71	31
Trump	2	101	9½
Jennings wheat	0	0	60
Rough Chaff	15	94	3½
Lammas	25	156	8
Dolt	0	3	50½
Michigan Wick	0	4	65
Russian	3	2	35
Muskingum	0	10	45
Arnold's Hybrid	0	0	53
Fultz	0	3	68
Nursery	5	17	33
Treadwell	40	43	42
Hertz's White	42	43	13
Deihl	8	27	41
Arnolck Gold Medal	15	71	40½
Clauson	10	73	43
*Field Clauson	0	0	0
Greecian White	0	83	3
Red Russian	0	30	6
Childham	0	43	1

*No flies were found in the Field Clauson situated 120 rods from the plats.

The inference cannot be drawn from the foregoing table that some varieties are insect proof or even nearly so. We can infer that where there are several varieties of wheat growing side by side some varieties seem to be preferred to others. Some varieties stand erect until harvest, but the blossom seems to blast when the stalk is infested, other varieties fall down at once.

The grain was threshed out by hand. The yield per acre of some of the varieties was estimated as follows: Shumaker, 40.8 bushels; Fultz, 38.5 bushels; Michigan Wick, 36.88 bushels; Jenning's White, 34 bushels; Mediterranean, 24.88 bushels; Treadwell, 23.8 bushels; Diehl, 23.3 bushels; Arnold's Gold Medal, 23 bushels; Arnold's hybrid (red), 30.1 bushels; Muskingum, 25.5 bushels; Clauson, 24.88; other varieties produced 9.85 and 20 bushels per acre. The three last varieties in the list should not be compared with the others, as they were sown much later. During the fall of '78 another experiment was commenced, the object being to see the comparative ravages of the Hessian fly upon late and early sown wheat. Commencing Sept. 6th, Clawson wheat was sown, in plats, every two or three days until Oct. 10. Professor Ingersoll found that the fly did not work last fall on those plats sown after Sept. 24th, the flies growing less as the plats were sown later.

This spring, however, he found no differences; they worked on all alike. In fac the numbers appeared to be more upon late sown wheat. But there were cases where the fly had worked so severely the fall previous in early sown wheat as to nearly destroy it, so that the best yields were invariably found in late sown wheat. Thus we find this important question still remaining open for argument. We cannot best practice all the remedies known inducing our neighbor to do the same, and hope for the destruction of this pest before it shall have reached the larger wheat growing region of the west. We have to thank our college for the important work she has done, and is doing in the improving of wheat. More anon.

Twenty-four business buildings in Farmers city, Ill., were destroyed last Saturday by a fire supposed to be incendiary. The loss amounts to $100,000.

Sioux Falls Water Power.

The time toward which Sioux Falls and her friends have been anxiously looking for months has arrived, and prospect is turned into reality. Yesterday, J. H. Drake, trustee for the water-power, Judge E. C. Palmer, of St. Paul, their attorney, and W. H. Bailey, who had charge of the survey of inspection made last week, arrived here to consummate the transfer of the falls, island and adjoining property to the company of capitalists which has been organized for the improvement of the power and the erection of mills and factories. Yesterday afternoon and this forenoon were devoted to an examination of the title and all its ins and outs by Judge Palmer, who gave the matter an inspection so minute that no loop-hole is left for subsequent trouble. After this was concluded, the deeds of the original owners were turned over, the consideration therefor paid by the purchasers, and the property passed into new hands, consummating a transaction which has been intensely watched by us all and doing more than anything else in our history to settle upon sure foundation that future for which faith has heretofore been the chiefest prop. The work of improvement of the power will begin at once, and be carried forward as rapidly as possible, giving the town an impetus necessary not so much to stimulate the present as to establish the hereafter.

The property comprising the water-power enjoys the distinction of having been the first piece of land ever entered in Dakota. Judge Brookings, with others, made a squatter settlement near the island about noon, August 25, 1857, nearly twenty-two years ago. A survey of a single township was made in 1856, after the ratification of the transfer treaty with the Sioux indians, being the first survey of lands in what is now Dakota territory. In October, 1862, Judge Brookings entered the northwest quarter of section 16, township 101, range 49, comprising the island and property west. About the same time, Judge Brookings also entered for Dr. J. L. Phillips the southwest quarter of the section, on which the principal part of the town now stands. A. F. Shaw entered the northeast quarter of the section, lying east of the island, and subsequently, by act of congress, the heirs of Wm. Stevens were allowed to enter the southeast quarter of the section, he having neglected to do so before he died, the property being that which is now in litigation in the celebrated case of Murdock vs. Gilbert, the suit growing out of circumstances connected with the entry. These several entries were given precedence over any that might be made by other parties, by virtue of a law of congress which gave to ante-survey squatters the right to enter it as a whole and acquire the title jointly, or divide it into quarters and each take a share.

September 10, 1863, a patent for the property was issued to Judge Brookings from the United States land office which had been established at Vermillion, and that was the first patent ever issued in the territory. Gov. Newton Edmunds, at the time of entry acquired an undivided one-fourth interest in Judge Brookings' quarter section for about $120. Subsequently the property was partitioned into the east and west half of the quarter section. The west half, lying along the bluff west of the island, was so partitioned, each party in interest taking a due share, but the east half, containing the island and the falls, was still held jointly, Gov. Edmunds owning an undivided one-fourth. This, as we have said, cost him $60, and now, after holding it less than seventeen years' he sells it for $9,500—a very fair investment.—*Sioux Falls Pantagraph.*

EXPERIMENTAL FARM NOTES---III.

By CHAS. Y. LACY, Professor of Agriculture at the University.

WINTER WHEAT.

No winter wheat has been on trial this year, but since it has been several times suggested of late that the southern portion of the state might perhaps grow it more successfully than spring wheat has been grown oflate years, we reproduce the result of experiments made in 1878:

Four varieties were sown Sept. 19, 1877, and the 5th three days later. The soil was sandy and plowed just before sowing. The following table exhibits the results of the trial.

	Bush. per acre.	When ripe.
Jennings' White	23.1	July 15
Clawson White	21.9	July 15
Square Head	5.9	July 19
Fultz	19.8	July 12
White	19.6	July 15

NOTE.—It was the design that all the varieties should enjoy an equal chance; but through miscalculation a narrow strip of Jenning's White was sown on ground on which corn had been manured in the hill. The effect of the manure was plainly visible, and doubtless was the cause of the superior yield of this variety over the Clawson, which, from the opening of spring until ripening, presented the most vigorous and uniform appearance.

The latter is the variety now so so generally sown in New York, and the subject of so much favorable comment in the eastern agricultural papers. It is the variety, also which we should recommend to those making a trial of winter wheat.

The yield per acre as shown in the table is not discouraging, though it is to be regretted that spring wheat sown at the usual time was not included in the experiment for the purpose of comparison. The experiment does not guarantee success with winter wheat, even in southern portions of the state, but it seems sufficient to encourage a trial of it.

Some other considerations also invite a trial of winter wheat in the sections named. (1.) The yield per acre is, in general, greater in winter wheat localities than in spring wheat localities. Probably because the plant has an opportunity for more complete development. (2.) The above varieties of winter wheat ripened from five to seven days earlier than Scotch Fife wheat sown on similar soil at no great distance. This advantage in ripening will do something toward getting the crop out of the of the hot, moist weather which is generally conceded to be the cause of blight. (3.) Winter varieties, of which there are many, differ greatly in hardness, and while one may fail to withstand the thawing and freezing of winter and spring, another may succeed. In like manner, though it may fail in the poorest soil and most exposed situation, it may succeed under any ordinary conditions. Hence, trials of winter varieties should be numerous and repeated, and not abandoned with the first failure.

The exports of locomotives from the port of New York from Jan. 1 to June 30. were forty-five engines, valued at $312,000, against only thirteen last year, valued at $115,000. During the first half of the current year there were also shipped one hundred and fifty-seven passenger and freight cars, valued at $143,000, against one hundred and six last year, valued at $83,200. Car wheels shipped from Jan. 1 to June 30, this year, two thousand seven hundred and eighty, valued at $25,300, against two thousand nine hundred and eighty eight same time in 1878, valued at $20,880. The shipments were chiefly to the West Indies and South American countries.

The Cleveland Paper Company's establishment at Cleveland, O., was partially burned on the 23d. Loss $30,000.

Smut in Grain.

Occasionally, and sometimes frequently, one may observe the heads of wheat, oats, barley, rye and the ears of corn filled with a black, powdery substance which is generally known as smut. When an ear of grain thus affected is examined, it will be seen that the substance of the grain is changed into this fine black powder, or that the grain is displaced by a puffy, swollen mass of the powder, the latter being more particularly to be seen in corn. This smut, when viewed under a microscope of high power, is seen to be composed of black, round balls, which are so small that 1,000,000 of them would cover no more than one square inch of surface, and 4,000,000 of them are able to occupy the bulk of a single grain of wheat. These minute balls are the spores or seeds of a fungus, a plant which has several intermediate stages of growth, and finally reproduces a new set of spores.

The minute seeds are small enough to float in the atmosphere, to adhere without being noticed to the grains which are sown as seed, or to rest in the ground until they come in contact with the sprouting seed and infect the growing wheat. Immediately upon contact with a root of wheat the smut-spore strikes a filament into the tissue of the plant and infects it as with a poison. The parasite penetrates throughout the tissues of the plant, sometimes, as with corn, bursting out upon the stalk, but generally appearing in full development in the ear or spike when the grain is forming. The cellular tissue of the grain or plant thus infected by the fungus is occupied by a vast number of four-sided cells or cavities, separated by walls, and which are filled with a mass of very minute adherent granules, perfectly round and at first green, but afterward of a pale reddish brown color; at length the cell-walls disappear, the granules separate and appear as the black—but really rusty brown—powder which we call the smut. By proper treatment the smut-spores can be made to germinate and grow while under observation, when the process of growth is seen to be, as usual with all fungoid vegetation, a throwing out of white threads called "mycelium," and the gradual formation of the brown spores or seeds which we know as smut in the substance of this mycelium.

When smut is abundant, crops are either totally ruined or so damaged as to be worth very little. Further, this smut is proved to be injurious to cattle which consume smutty fodder, and it is reasonably believed that much disease originates from the feeding of straw or corn-stalks infested with smut. Fortunately, we have an effective remedy within our reach. It has been discovered that caustic alkalies destroy the substance of the smut; and, also, that the application of sulphates of iron, copper and zinc have the same effect; of these latter the sulphate of copper—the commonly known blue vitriol—is the most useful. The usual method of applying these remedies is to steep the seed in a solution of the various substances. The solution may be made as follows, and either the one or the other may be used as found convenient:

One pound common salt in one gallon of water.

One pound glauber salts in one gallon of water.

Four ounces sulphate of copper in one gallon of water.

Sufficient of the solution should be made to saturate the seed, or thoroughly moisten every grain. When the seed has steeped for two hours it is drained and spread upon a floor and sprinkled with dry lime in powder; that which has been air-slacked, by exposure to the atmosphere in a covered shed, until it falls to a fine dust, is best fitted for this use. The seed is then shoveled and stirred until each grain has been coated with the lime. In an hour or two it will be dry and may be sown. There are at least fifteen species of smut fungus known to botanists. The genus is known as *Uredo* by some, and as *Ustilago* by others. The species which attacks wheat is known as *Uredo Segetum*, or the wheat smut; that of corn as *Uredomaydis*, the maise-smut. Other species infest oats, barley, rye, grasses, sedges, and reeds (or marsh grasses, so-called), and other plants. One infests the wild onion, and the same attacks the onions grown in gardens. The grasses most infested are orchard grass (*Dactylis glomerata*), and some varieties of *Poa*, more especially *Poa aquatica* and *Poa fluitans*; but the cultivated species of this genus, or Kentucky blue grass, *Poa pratensis*, or *Poa compressa*, the June grass or spear grass of our fields, are not often attacked. There are other fungoid parasites which attack wheat. These are mildew, rust and bunt, the last being a species of smut known by the name of *fœtida*, or stinking smut or bunt, from its foul smell. The first and second are well known; the last is not so frequent, but is sometimes found in ripe grain, which, when ground in the mill or crushed in the fingers, appears as a mass of black dust of disagreeable scent. All these are subject to the same treatment as for the prevention of smut. Steeping is a sure remedy, and any farmer who neglects to avail himself of so simple a help should certainly refrain from complaint if he finds himself a sufferer. "Wisdom is a defense," and if we are wise we shall defend ourselves against this enemy, and use our influence to prevail upon neighbors to do the same. This and other evils are spread by the neglect of a few, or even of one, to use remedies, and the failure of one will lead to the stocking of the land of a hundred others, who may then justly complain of the injury. —*N. Y. Times.*

A New Road Locomotive.

A new road locomotive has lately been patented by Richards & Dale, 36 Taylor street, Springfield, Mass., in which the traction will be secured by vertical bars acting as feet, dispensing entirely with driving wheels. The motive power will be applied directly to the main shaft by a crank-rod and crank, as in ordinary engines. No new principles being thus involved in the use of the steam, the machine is very simple and more likely to be practicable. The frame of the engine is horizontal with a two-wheeled truck at the rear end, while the main shaft is in front, in a horizontal transverse position. This shaft bears four cranks in addition to those that drive it. Upon each of them is a leg consisting of a straight bar, provided at the lower end with a suitable foot or shoe by which the traction is obtained. There is also an arrangement for shortening the length of step in ascending grades or drawing unusual loads. The machine will work equally well backward or forward, and if a foot should happen to cut a channel in the ground without drawing the carriage forward it can be turned in either direction to get a fresh start. The engine may be detached from the feet so that it can be used for hoisting as well as locomotion. In the absence of illustrations we are unable to say whether the machine could be made serviceable in our mining regions or not.

The Italian harvest has been disastrously affected by drought and heat.

General News.

Chicago has several labor strikes to deal with.

Lemars, Iowa, is greatly excited over an alleged gold discovery.

A fire in Hartford, Mich., on the 22d destroyed eight buildings.

Peoria, Ill., has just sent a shipment of plows to the city of Mexico.

The Indians are said to be starving in the British Northwest Territory.

There is said to be a scarcity of cars to move the wheat in western Iowa awaiting shipment.

A colony of Quakers from near Philadelphia, is expected soon to settle in Ida county, Iowa.

A powder mill at Tamaqua, Pa., exploded the other day, killing one man and fatally injuring two girls.

Gen. Hood, of New Orleans, whose wife died a few days ago of yellow fever, is ill of the same disease.

It is said that General Grant is anxious to become the president of the proposed Nicaraguan Canal company.

An earthquake shock was experienced in southern Canada on the 21st. Some places in New York also felt the shock.

Excessive rainfall in the vicinity of Pittsburgh, Pa., has caused considerable damage to railroads and other property.

The St. Paul, Minneapolis & Manitoba branch road from Fisher's Landing is nearly completed to Grand Forks, Dakota.

There is trouble between the Southern Minnesota and Sioux City and Pembina roads over the right of way through Sioux Falls.

W. R. Bell, cashier of the American Express company at Kansas City, Mo., has disappeared with $10,000 of the company's money.

A boy only eleven years old, in Louisville, Ky., has been arrested for the murder of a playmate, whom he killed by hitting him on the head with a stone.

The contract for the government improvements in the Mississippi river above Winona will be let at Rock Island. The works will involve an outlay of about $20,000.

The Russian government is on the point of signing a contract with American firms for the construction of a number of cruisers at an aggregate cost of 20,000,000 roubles.

The First National bank of New York and its associates in the bond syndicate are $33,000,000 in arrears to the government on account of subscriptions to four per cent bonds.

The secretary of war has ordered Carlisle Barracks in Pennsylvania to be turned over to the interior department, to be used for a school for the education of indian youth.

The cigar makers' union in St. Louis has brought many of the manufacturers to its terms. All the Chinese cigar makers in the city have entered the union and joined the strikers.

The Capitol City bank of Columbus, O., was robbed of about $20,000 the other day. It was done in the usual way; one man engaged the president in conversation while his confederate committed the robbery.

J. S. Kalloch, workingmen's candidate for mayor of San Francisco, was shot a few days ago by DeYoung, of the San Francisco *Chronicle*. The attempted assassination was the outcome of a political quarrel.

Good for the Slater Reel.

[From Village Record, West Chester, Pa.]

Last week we stepped into the mill of Robt. G. Smith, of Embreeville. Mr. Smith was absent but the miller, Mr. Bennett, welcomed us in and very kindly escorted us through the mill. The mill was making new process flour, and beautiful looking flour it is too, as white as snow, clean and very rich looking. We examined a little of it through a magnifying glass that enlarged it to the size of an ordinary plate of ice cream, and it looked for all the world like a pyramid of that summer luxury—not one speck of anything but the white flour could we detect with the aid of the powerful glass. It is scarcely necessary for us to add that Mr. Smith uses the Slater Reel, manufactured by C. B. Slater & Co., Blanchester, Ohio.

Foreign News.

Russia is not on cordial terms with either Austria or Germany.

There are rumors of an alliance between Germany and Austria.

Germany and Spain will soon conclude a new treaty of commerce.

A treaty of peace has been signed between Spain, Peru and Bolivia.

Starvation and misery are still the order of the day in the Indian province of Cashmere.

A Russian girl fifteen years old has been exiled to Siberia on a charge of being a nihilist.

Sir Rowland Hill, the originator of the the cheap postal system, died in London on the 27th inst., aged eighty-four years.

Recent trade reports from Shanghai, China, show a great diminution in British transactions, while American commerce has nearly doubled in the past year.

English cotton manufacturers are still further reducing wages, and the winter seems likely to be one of extreme depression in trade and destitution among the operatives.

The harvest in south Persia and the Bagdad and Bassorah districts of Asiatic Turkey has been seriously affected by drought. In Mesopotamia, wheat has risen to three times the usual price.

The grain crop of Great Britain is estimated at one-third less than the average, amounting to a loss of £25,000,000 to the cultivators. At least 16,000,000 quarters will be wanted from abroad.

At a recent meeting of cotton operatives at Oldham, England, resolutions were passed protesting against the proposed five per cent reduction of wages and declaring that in the present industrial condition of England, emigration is absolutely necessary.

The international grain fair opened at Vienna on the 25th inst. The official report states that the Austro-Hungarian wheat crop the present year is nine million metric centals less than that of the crop of 1878, but owing to accumulated stocks of 1878, only two million centals will have to be imported. The importation of four million metric centals of rye will be necessary, but the oat crop is sufficient to allow a margin for export.

Utilization of Exhaust Steam.

According to the invention of Mr. N. W. Ericson, of Stockholm, he lets steam of higher pressure, or higher temperature, or both higher pressure and temperature than the pressure or temperature, or both, of the steam which is to be used in a steam engine or for any other purpose, pass into an apparatus for the suction and compression of elastic fluids, in order that the said higher or stronger steam may in such apparatus act as the suction fluid to the said spent steam; this suction and compression apparatus is further connected with the apparatus wherein steam is to be used in order that the spent steam may to a greater or less extent be drawn into the suction and compression apparatus when the acting or higher steam passes through it. The mixture of the acting or drawing steam and the spent steam passes through the delivery pipe of the suction and compression apparatus (and its continuation, as required) either to place where the thus compressed steam is to be used, or else first through an apparatus containing saturated steam or water, or in so near connection with water that the steam, if in a superheated state, becomes more or less saturated or lowered in temperature, or else into an apparatus wherein the steam, by cooling, is rendered liquid, and the heat thereby given out is used for generation of fresh steam. This latter apparatus may be the steam boiler in which the acting superheated steam is generated, or another steam boiler vessel. The suction and compression apparatus may be any suitable suction and compression apparatus, such as an annular or other jet apparatus.

Russian Wheat.

Robert Orbinsky, a representative of the Russian government now in this country for the purpose of investigating the grain interests of the west, with especial reference to elevator construction and operation, and the question of railroad transportation and rates, has written a communication to *The St. Louis Republican* in which he says: On the English market the wheat of southern Russia appeared the first time in the winter of 1802-3, when the prices, under the influence of bad crops for several years and under the then existing corn law, had raised to the exceptional height of 110 shillings per quarter. You know, sir, that under this law foreign grain trade was nearly impossible in England beyond exceptional circumstances as that I mentioned. In the following years we continued to export from southern Russia, but it was rather to Spain, France and Italy that we did so, than to England. The bad crop of 1817 again opened to us the latter market, and from that time we have not ceased to occupy there a place rising every year. In 1847 we were actually the first furnishers of bread for the English nation. We could do so because the production of our country was not limited there, and the prices for grain in southern Russia were then lower than everywhere in the world. There have been years when in the market of Odessa, itself pretty far from the places of production, a bushel of wheat of no bad quality could be sold, with profit for the seller, for fifteen cents, and that in moments when the average price in the London market was sixty shillings per quarter. And yet the distance from Odessa to London is somewhat shorter than the distance between London and New York. You can see by it, sir, how much money under such circumstances could be be made by foreign merchants in our southern country, and you will understand now how a great party of the Greek insurrection has been paid off by Russian wheat.

Since that time prices certainly have changed, become lower in England and higher in Russia, but still Odessa remained the queen of the grain trade of the world, growing to an average amount of twenty millions of bushels per year. America, as the French used to say, was not yet invented for grain trade. That happened only about 1830, and since that time the role of America is increasing from year to year, so that now it becomes truly overpowering. The last year your country has furnished no less than 51 per cent of the want of England and we only 22. Ten years ago it was exactly the contrary of that proportion.

I can say I was the first man in Russia that had foreseen and foretold such a result. In 1875 I published a brochure on that subject, and was laughed at by our press. It was considered a product of my imagination. I was called an incorrigible pessimist and my pessimism not worthy of attention. So I was, indeed, but events have proved that truth was on my side. Then it was very natural for my government to inquire in what manner and by what way such a change could take place. With this inquiry I had the honor to have been charged.

Till now the productive power of Russia is as great as that of America; perhaps even greater. In 1870 your wheat crop arrived to the cipher of 230,000,000 and the amount of ours was not beyond 325,000,000. But our population, however, in the greater part fed by rye, is nearly twice that of yours, and consequently the surplus we can sell abroad is less than yours. But it is not the quantity that decides the question, but the kind of use which is made of it, and on this behalf certainly nothing can be more instructive for us than the example of America.

A Put-up Job in Matrimony.

"I have been a subscriber to *The News Letter* for the last ten years," said a "broke-up" looking young man coming into this office yesterday and sitting down in front of the managing editor, "and I call upon it for aid and assistance."

The editor looked rather pointedly at the clock, and asked what he could do for the visitor.

"Why, I want you to hold up to public scorn an detestation a fellow called Mooney, and a mean red-headed girl named Morrissey."

"Scandal case, eh?"

"A heap sight worse. You see I was engaged to be married to that girl—her name's Maria—and Dr. Stone was to hitch us up the first of the month, so I asked this mean cuss, Mooney, to be one of my groomsmen."

"He consented, of course."

"You bet he did. You see Mooney has a big black moustache and—and all that—and he's a good deal of a masher, as it were. He said he'd try to make it lively and pleasant for the bridesmaids."

"And did he?"

"Why, he actually made love to all four. Got the other groomsmen furious by flirting with the whole lot. Told 'm it was the correct thing in Europe for the groomsmen to kiss the bridesmaids all round before and after the ceremony, and that they ought to meet and practice to get the thing in good running order."

"Did they practice?" said the editor laying down his pen.

"Did they? Why, it was just disgusting the way they went on every evening. To see that villian Mooney pretend to steer down the aisle and back up against the chancel rail, and then, when the mock service was over, kiss and paw around the girls, would have made your hair raise a foot. Why, he actually began flirting with my Maria—I mean that Morrissey girl,

"Made love to the bride, eh?"

"Exactly; and she a letting him do it—mind you. Well, yesterday they said they were going to have a fine rehearsal that night, and to make the thing more perfect, they intended to get Bings, the young divinity student, to read the service. And as I was going over to Oakland with a load of furniture for our new house, Mooney said he would officiate in my place.

"That was kind of him."

"But wait a minute. When I got back and called at Maria's house about eleven p. m., I found all the party sitting around the parlor looking very serious, except the bride who seemed kinder frightened. "What's the trouble?" said I; What's happened?"

"Well, the fact is," says that cheekey Mooney, "there's been the most singular accident, and the queerest mistake you ever heard of in your life. You see, we were rehearsing the service as usual, and I was a-holding Maria's hand just like this, when young Bings got sorter absent-minded so to speak, and the first thing he knew he pronounced us man and wife in the regular form, and he now says we are married in real earnest. Too bad, isn't it?"

"Singular mistake," said the editor.

"But the worst of it was the way that false hearted hussey took it. She said it was pretty hard, but what couldn't be cured must be endured, and that she supposed they couldn't get a divorce under a year, anyway, and a lot of stuff like that."

"Peared resigned to her fate, as it were."

"Exactly; and then Mooney chipped in with a lot of stuff about not crying over spilt milk, and said he'd take the furniture off my hands and pay for the ring. Said he'd give his note for 'em. Cheek? Why, that man has more gall than a pawnbroker's clerk, and I want you, Mr. Editor, to show him and his red-headed, big-footed wife up the very worst way. Accident, indeed! Why, it's the plainest put up job I ever saw in the whole course of my life. Just let 'em have it in italics, if you please, and I'll take 500 extra copies!"

The editor said he'd attend to it, and has since written to Mr. Mooney to say that a position as a reporter was always open to him on his go-ahead journal—*San Francisco News Letter*.

The English Grain Market.

LONDON, Aug. 26—The Mark Lane *Express*, in its review of the British grain trade for the week, says: The heavy rainstorms the past week have scarcely laid the crops in many parts of the northern and midland counties, while the submersion of low lying lands has caused the wheat-plant to rot at the root and develop mildew in the ear in large quantities. Hay has been washed away in Derbyshire by the floods. Nearly everywhere the fields are choked with weeds, and there is every sign that the present year will be as bad or worse for the farmers than its immediate predecessors. In more sheltered districts some parts of wheat and barley are ready to be cut. This is not at all general. In Scotland the farmers, during the recent short spell of the weather, secured a good deal of hay, which is not so much injured as was feared. The cereal crops in the north are still quite green. Much of the grain in the uplands may never ripen at all. October rather than September will probably be the harvest month in Scotland. Turnips there are improving and potatoes are generally free from disease, but the yield will be late and deficient. The relapse of the weather has caused a revival in the wheat trade, in some instances enabling sellers to recover the recent decline of one shilling per quarter. Imports have again been excessive, but for imports having exceeded the usual summer climate, the strength of trade has been so marked, higher prices would doubtless have been obtainable, but it is difficult to persuade millers to buy except in retail. The capacity for gigantic shipments is thoroughly understood by buyers, who operate cautiously, but at the same time more freely during the past week at a slight advance on Monday's currencies. In another month more reliable data will be obtainable concerning European crops upon which to indicate the further course of prices. Barley maintained previous prices, but eased slightly upon the pressure of increased supplies. Arrivals at ports of call have been moderate. Wheat fluctuated with the weather, but continued heavy. Shipments cabled from America prevented any advance beyond about 6d per quarter on wheat. Maize favored sellers with a moderate inquiry. Wheat and maize have both been in a fair request for future delivery at 3 to 6d per quarter advance. Barley has been in good demand. Prices were firmly maintained. Sales of English wheat last week 18,862 quarters, at 41s 3d, against 26,279 quarters, at 45s 2d for the same period last year. The imports into the United Kingdom for the week ending 16th of August, 1879, were 1,458,598 hundred weights wheat and 280.224 of flour. In Mark Lane yesterday (Monday) there was a moderate consumptive demand for wheat at six pence per quarter advance on last Monday's prices. Flour steady. Maize slightly lower. Oats three pence to six pence per quarter higher.

Rather Embarrassing.

A Chicago statistician, of curious turn of mind, made inquiry by letter as to the exact length of the shortest pair of feet in the Lime-kiln club. As the secretary read the letter, sixty-four pair of feet were suddenly drawn under chairs and benches. The sixty-fifth pair, belonging to Elder Toots, were too large to be hauled away all at once and they therefore stood out like Jay Cooke's kitchen expenses.

"Dat am a leadin' queshun," replied Brother Gardner, as he looked around the hall. "It am my private opinyun dat de length of a man's feet do not properly come under the head of staytistics, and the seckretary needn't bodder hisself to answer de letter. Among de home industries built up by de organization of dis club am de rapid sale of No. 14 butes an' brogans, but furder dan dis I hev no partickulars."—*Free Press.*

Mary Anderson has bought a residence in Syracuse. *American Punch* thinks she'll get over her freshness there. How dare you Syr-acuse her of being fresh.—*Addie Boyd.*.

A printer's devil is seldom a blockhead, but from force of circumstances he is an inkompoop.

WANTED

Two second-hand Porcelain rollers. They must be in fair order. Address,
OSTRANDER, HOPPIN & DEAN,
8 22-6t. Minneapolis, Minn.

THE VICTOR

WHEAT HEATER AND DRYER,

(Improved Provost's patent, May 21, 1878,—April 8, 1879,)

Has shown itself to be so superior to all others in excellency of workmanship and great durability combined with perfect and uniform heating qualities, as to make it sought after by millers desiring the best. The "Victor" has no superior and has never been rejected in a single instance after a fair and impartial trial. Capacity as large or larger than any other heater in the market. Satisfaction guaranteed. Send for circulars.

VICTOR HEATER CO,
J. W. BIRDWELL, General Agent.
223 Washington Ave. South, Minneapolis Minn.

GLORIOUS NEWS

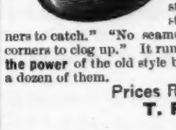
FOR MILLERS.

MONOPOLISTS, BULLDOZERS, AND VENDERS OF WORTHLESS MACHINES

Who have long imposed on the milling public, must now give way to Hunter's latest improved purifier. The milling interests of the United States will not admit of exorbitant prices, nor will manufacturers be able to pay high-toned millwrights 35 per cent. for selling or recommending their machines. Hunter's new purifier retains all the superior qualities of the old, but it has been simplified to such an extent that he is enabled to reduce the price nearly one-half; furthermore, he is not compelled to take out a license or pay royalty, neither has his new machine anything in common with other purifiers. He has recently invented a device for cleaning the cloth, which proves far superior to any brush operated under the screen. This device renders it impossible for middlings to stick in the meshes of the cloth, or for adhesive particles to accumulate on the screen.

ANDREW HUNTER,
471 West Washington St.,
Chicago, Ill.

DUC'S
Improved Elevator Buckets.
BEST IN USE!



This is the only **Scientifically Constructed** bucket in the market. It is struck out from charcoal stamping iron. "No corners to catch." "No seams to burst." "No interior corners to clog up." It runs with great ease, and **half the power** of the old style bucket. Will outwear half a dozen of them.

Prices Reduced.
T. F. ROWLAND,
Sole Manufacturer,
Brooklyn, N. Y.

ROBINSON & CARY, Agents,
St. Paul, Minn.

WELL-AUGER. Ours is guaranteed to be the cheapest and best in the world. Also nothing can beat our SAWING MACHINE. It saws off a 2-foot log in 2 minutes. Pictorial books free. W. GILES, Chicago, Ill.

XUM

The Iron Horse.

No song is mine of Arab steed—
My courser is of nobler blood
And cleaner limb and fleeter speed,
And greater strength and hardihood
Than ever cantered wild and free
Across the plains of Araby.

Go search the level desert land
From Sana on to Samarcand—
Wherever Persian prince has been,
Or Dervish, Sheik, or Bedouin,—
And I defy you there to point
Me out a steed one-half so fine.—
From tip of ear to pastern joint—
As this old iron horse of mine.

You do not know what beauty is!—
You do not know what gentleness
His answer is to my caress.
Why, look upon this gait of his!
A touch upon his iron rein—
He moves with such a stately grace,
The sunlight on his burnished mane
Is barely shaken in its place!
And at a touch he changes pace,
And gliding backward, stops again.

And talk of mettle!—Ah! my friend,
Such passion smolders in his breast
That when awakened it will send
A thrill of rapture wilder than
Ere palpitated heart of man
When flaming at its mightiest.
And there's a fierceness in his ire—
A maddened majesty that leaps
Along his veins in blood of fire,
Until the path his vision sweeps
Spins out behind him, like a thread
Unravelled from the reel of time,
As wheeling on his course sublime
The earth revolves beneath his tread.

Then stretch away my gallant steed!
Thy mission is a noble one;
You bear the father to his son,
And sweet relief to bitter need.
You bear the stranger to his friends;
You bear the pilgrim to the shrine,
And back again the prayer he sends
That God will prosper me and mine.
The star that on thy forehead gleams
Has blossomed in our brightest dreams.
Then speed thee on thy glorious race!
The mother waits thy ringing pace;
The father leans an anxious ear
The thunder of thy hoofs to hear,
The lover listens far away,
To catch thy keen, exultant neigh;
And where thy breathings roll and rise
The husband strains his eager eyes,
And laugh of wife and baby-glee
Ring out to greet and welcome thee.
Then stretch away, and when at last
The master's hand shall gently check
Thy mighty speed, and hold thee fast,
The world will pat thee on the neck.

—*J. W. Riley.*

The Mysterious in Boiler Explosions.

There is beyond question an element of mystery attending certain boiler explosions. At one time all explosions of boilers, save those which obviously resulted from shortness of water or extensive corrosion of plates, were regarded as mysterious and remarkable. Theories have been formed almost without number to account for their occurrence—in a word, to solve the mystery. The spheroidal theory of Boutigny d'Evreux may be cited as an example. When water is dropped on a hot plate it assumes the spheroidal condition, runs about in drops, and evaporates slowly. The drops are really not in contact with the plate at the time, each drop being enveloped in an atmosphere of his own vapor. When the plate cools the water touches it and flashes into steam. It was supposed that under certain circumstances water assumed the spheroidal condition in normal steam generators, and that a great development of steam ensued when the furnace plates cooled a little; so much steam being made thus in a few seconds that the boiler burst. This idea is now well known to be fallacious.

Another theory was that if a boiler was heated red hot and cold water pumped in it would infallibly explode; this is obviously the tail end of the speroidal theory. Inasmuch as the specific heat of iron is but one-ninth that of water, in round numbers it follows that nine pounds of iron heated to about 1,500° must give up their heat to make one pound of steam; and it has never yet been shown how enough red hot iron could be present in a boiler to cause a development of steam with which the safety valve could not deal. Many experiments have been carried out to test the point, with negative results as far as explosions are concerned.

The electrical theory was broached. What this meant we never understood, nor did we ever meet any one who did. One gentleman promised to prevent all explosions from this cause by incasing every boiler in thin sheet copper. Another proposed to fit conducting wires to put boilers in communication with the earth. The notion that water was decomposed into oxygen and hydrogen, and subsequently recomposed with a terrible explosion, kept its ground for a long time. We believe we may say that no engineer possessing a moderate knowledge of chemistry holds such a theory now. The inspecting engineers of the various boiler insurance and assurance companies were the first to place the whole subject on a sound footing. They showed as a result of their experience that boilers burst because they were too weak to withstand the strains brought on them by the internal pressure. They proved that in the vast majority of cases furrowing, and grooving, and corrosion in all their multifarious forms, were the agents operating to bring about boiler explosions, and they carried back such catastrophes from the regions of romance to those of everyday life. There is some reason, however, to fear that these gentlemen have gone a little too far; and that by assigning all boiler explosions to one cause they are doing harm and stopping inquiry into certain secrets of nature about which we do not know quite so much as is desirable.

That by far the larger number of explosions which occur every year in England are due to weakness of the boilers which give way, either congenital or acquired, we should be the last to dispute. But it is equally indisputable that events take place now and then which quite upset all conclusions based on the idea that explosions always take place because a boiler is too weak to withstand normal strains, and these said events apparently contradict much that sound scientific authorities teach Thus, for example, although the entrance of cold water into a red hot boiler ought not to cause an explosion, yet there is one case at least on record in which, on a pail of cold water being poured suddenly into a red hot kitchen boiler, a most violent and disastrous explosion took place. The weight of metal engaged here was, however, very great as compared with that of the water. It is also shown that explosions have ensued when water was pumped into plain cylindrical externally fired boilers, which had been allowed to run short.

On the other hand, boilers patched and re-patched, and seemingly worthless, have by the hundred done their duty for years without a catastrophe, while boilers as well made as possible, and in excellent condition—nearly new in fact—have exploded with disastrous results. So long as furrowing and corrosion are present it is easy to account for the failure of a boiler. It is when explosions of strong boilers occur that inspectors are at fault, differences of opinion arise, and we become enveloped in an atmosphere of mystery out of which it is difficult to find the path which leads to certainty. Two notable examples of this have been recently recorded in our columns; one is the Coltness explosion, when six boilers out of ten flew away at once like a covey of birds; the other is the Kersley explosion, when one boiler out of eight burst, leaving the rest intact.

As regards the Coltness explosion, that, as is well known, has been explained by Mr. Fletcher on the theory that one boiler which exploded first had the steam pipe plugged up, and consequently gave way from a sheer accumulation of pressure. We cannot find that one tittle of definite evidence was adduced to show that any such plugging took place. Mr. Fletcher is, no doubt, satisfied on this point, but we are not. In fact his theory is based on pure assumption. But, granting that he was right, how are we to account for the explosion of the remaining five boilers? One explanation is that the boilers were bedded so close that they rested against each other, and that each boiler as it gave way staved in the side of the next one to it. To make this an intelligible cause of explosion, it must be assumed that the sudden reduction of pressure on the outrush of steam through the side of the broken boiler caused so large a portion of the contained water to flash into steam that the boiler flew into pieces before the steam so produced could escape. But it is well known that the Coltness boilers were strong enough to stand a pressure of 300 pounds on the square inch, and it is difficult, if not impossible, to see how steam of any pressure like this could be produced. Only as much water would be converted into steam as would suffice to restore the pressure in the boiler to something less than what it was before the rent took place. To assume anything else is also to assume that once the process of flashing is established it will go on regardless of the pressure set up. This is a very important assumption; nay, more, it is a complete begging of the question. If it can be shown conclusively that the stored-up energy in a boiler can all be expended in flashing water into steam, if flashing is once fairly set up, without any consideration for the accumulation of that pressure which is inimical to the operation of the flashing function, then we are face to face with a new physical law which would clear away much mystery, and set boiler explosions, like that at Coltness, in a totally new light. It is a notorious fact that a great many explosions take place just when an engine is started. If we may assume that the sudden reduction of pressure sets up flashing, and that the process is continued by, if we may use the words, its own *vis viva*, then it is easy to understand why a sudden reduction in pressure may cause an explosion; but until some definite statement of facts is available, we must hold this idea to be pure, little supported theory, and nothing else. If we are asked, how, if we reject the theories of Mr. Fletcher and others, we explain the Coltness explosion, we reply that we cannot explain it, because there is not sufficient evidence available on which to base an opinion.

In the Kersley explosion we have a boiler, insured, carefully looked after, and apparently sound, going to pieces without having given any wanting in the way of leakage. Here again we find boiler inspectors dealing largely in pure assumption. Mr. Hiller, the engineer of the National Insurance company, took it for granted that an elbow pipe was broken off and let the water run out. But there is not a scrap of evidence that a cast iron pipe was broken as supposed. Mr. Baldwin, another boiler inspecting engineer, holds that Mr. Hiller is quite wrong, and that the boiler burst because the plates had become weakened by age; that they had "lost their nature," to use a word well known among iron makers. But even Mr. Baldwin finds all the plates he tested so strong that the boiler should have withstood on the lowest calculation double the pressure at which it was worked. It is to be presumed that the inspecting engineers of boiler insurance companies are the greatest authorities in existence on all that pertains to the life and death of steam generators. When we find any one of these gentlemen unable to form any opinion concerning certain catastrophes, which is not flatly contradicted by a professional brother, it would be folly to deny that there are mysterious boiler explosions—that is to say, explosions which occur from some cause or causes unascertainable. That we shall always remain in our present ignorance is very improbable. But we venture to think that the solution of our difficulties will come, not from the boilermaker or the engineer, but from an elaborate process of physical research into the laws which govern the generation and evolution from heated liquids of their steams or vapors. Many suggestive phenomena have been recorded which might serve to direct an inquirer. For example, the behavior of water heated under oil is, as shown by Dr. Frost many years ago, very curious and suggestive. Again, water may have its boiling point altered by various conditions other than those of pressure. It is not too much to say that although the more prominent aspects of evaporation and ebullition have been carefully studied, a great deal remains to be learned concerning the real nature of processes about which men speak all the more glibly the less they really know.—*The Engineer.*

Romance of a Young Man.

A young man from one of the back towns came in to buy a present for his girl last week. His wandering gaze being fixed by the gorgeous display in a dry goods window, he entered the store and bashfully stopped in front of a pretty young lady behind the counter.

"How much are those?" he inquired, pointing at a pair of handsomely wrought nickel-plated garters in the window.

"Seventy-five cents," replied the young lady sweetly, handing out the articles in question and blushing slightly. "I think they're kinder pretty, don't you?" inquired the young man, anxious for somebody else's opinion. "Very," replied the young miss; "they're the latest style." "Everybody wears them, don't they?" continued the young man. "Almost everybody," said the young lady, affecting an unconcerned air. "I was going to get them for a girl I know," said the young man, somewhat nervously. "Do you think she would like them?" "I should think she might—I don't know," returned the young lady blushing again. "Well, I don't hardly know myself," said the young man, picking up one of the dainty articles and examining it closely. "You don't suppose they are too large now, do you?" "Why—I—I," stammered the young lady, the blush growing deep. "They seem to be sorter big like," continued the young man, not observing her confusion, "but of course I wouldn't be certain. She's middlin' size, but not very fat, and maybe these would be a little too loose. I should think she was just about your bigness, and if these would fit you of course they'd fit her. Now, just suppose you try them on, an' if—" "Sir," exclaimed the young lady behind the counter, in an awful voice, that lifted the young man's hat on the ends of his hair, "you are insulting!" and she swept away to the rear of the store, leaving the bewildered youngster standing in amazement, holding in his hand what he supposed to be a beautiful pair of bracelets. And when one of the men clerks came and explained his mistake, the young man from the back town struck a direct line for his team, and in a very short time was tearing toward home at a rate that threatened to irretrievably ruin the old family horse. He won't buy any bracelets now until he's married.

River Taming in England.

The English government is now at work on a problem which is engaging attention in this state, and in other parts of the world, viz., the devising of some method by which the surplus water from the mountains may reach the sea without the destructive floodings of the low lands, which now follow the rain storms or snow meltings on the highlands. In England, this flooding of low-lying districts has become more destructive during recent years, because the systematic ditching and underdraining of the uplands give quick passage through the soil into the rivers to the surplus water which formerly was long held on the surface or percolated but slowly through the soil. We find but meager information concerning the provisions of the act which is now before parliament for the averting of floods, and can do but little more than state the fact without description of methods proposed. It may be said, however, that the subject has been studied by a royal commission and that a scheme has been elaborated from the report of their investigations. The *Agricultural Economist* thinks that the whole project is endangered by the fact that the proposed act orders that a part of the expense of carrying off the water shall be taxed upon the uplands whence the waters come. This, our exchange thinks, will awaken much opposition to the contemplated improvements. We suppose the uplands will hold that as water is prone to run down hill, it is no fault of the hill, but the iniquity is rather in the water, and if those below do not care to suffer injury they must get out of the way, or else corral the water so that its destructive power is held in check. This it is proposed to do by widening the rivers, and the power to carry out these improvements is to be vested in "River Conservancy Boards," who shall have full authority to condemn adjacent property, mill rights and the like, as their plans may require. One recommendation of the report is, that all arterial streams insufficient to carry their waters after heavy rains be widened very considerably indeed, and that the new banks be formed gradually shelving down to the banks of the stream that they may be available to bear grass either for mowing or for feeding of stock, when the waters are low. If this were carried out, the conservancy boards would no doubt let these river banks by the season, the revenue derived from which would lighten the taxation for the conservancy rate. Although most of the rivers would require considerable widening, this shelving bank system might, in a great measure, prevent the waste of land which would take place if conducted on any other principle.

In addition to preserving the lowlands, it seems that the system of upland reservoirs, for irrigating lowland meadows, is also contemplated, and this the *Economist* regards as a very promising feature. This has also been proposed for our own turbulent rivers. It is interesting to note the testimony brought forward in England in favor of irrigation, and comparing their moist climate with our arid one, we can but say if irrigation will do these things in the green tree what will it do in the dry. Our exchange says that if "there is one thing we are behind in more than another in our British husbandry, it is in making that extensive use of water which is made on the continent and in the east by processes of irrigation." It then proceeds to read English feed growers the following lesson: "The recommendations of old Arthur Young for laying out fresh water meadows might still be studied to advantage by the owners and occupiers of numerous districts, and as to benefits derivable therefrom, the same writer records an instance where nearly five pounds an acre was realized for the feed of a water meadow during six weeks of spring, and that nearly two tons per acre of hay was reaped from the land afterwards the same summer, which, together with the after-grass in autumn, made a splendid return. Yet when the same meadow could not be irrigated owing to some dispute respecting the water rights, very little whatever was grown on it."

These propositions to curb rivers from their wild work and harness them forever in the service of the farm, is one of the most interesting and important which is now advanced for agricultural engineers to reduce to practical operation.—*Mining and Scientific Press.*

Lake Itasca.

A member of the canoeing expedition which is en route from Lake Itasca to New Orleans writes from the head waters of the Mississippi to the Cincinnati *Gazette*: Lake Itasca is really a beautiful sheet of water, of light greenish hue, set in the midst of sandy hills from fifty to one hundred and fifty feet high, which are closely covered with dense forests of pine, fir and spruce, with some oak and other green woods that I did not recognize. Its form is three arms starting from the surrounding Schoolcraft's island. The north arm is two miles long, the southwest arm is two and a half miles and the southeast arm four miles long. The southwest and southeast arms form half a circle, the diameter of which, counting from the inner shores, is about two or two and a half miles. Facing the north, the north arm springs out of this semicircle of water about one-third of the distance from its end on the left. The north arm really tends east of north for two-thirds of its length, then west of north, the Mississippi river flowing out of the extreme end. The greatest width of the lake is about one and a half miles, and that is where the arms join. The arms themselves are not more than a mile wide. Their shores are indented with rounded bays, and in the water for probably two hundred yards rushes grow, with wild rice and some lilies nearer to the shore, which is firm sand mostly. In some places the alluvium from the hills has washed in and made very soft shores. At the extreme end of the southeast arm a bright little stream, a foot or two wide, with swift current, pours in over clean sand.

Into the southwest arm five streams flow, all insignificant except two. The smaller of these comes in among the grass and rushes, eight or nine feet wide at its mouth, but soon narrowing to a mere woodland rill. The larger contributes about one-third the volume of the Mississippi, is about 15 feet wide at its mouth, and comes in through low, swampy ground. We pushed up this stream with the canoes for nearly two hundred yards, then had to land. This, which may be called Elk river, flows about one mile from Elk lake, which lies south of Itasca about one-half mile, and is divided from it by sandy hills, over which some heavy yellow pines grows. We had thought that possibly the Mississippi might be traced above Itasca, but the character of the streams putting into that lake does not entitle them to be called the river. Into Elk lake, on the south, the surveyors found two little streams flowing, the largest, we learn, running probably ten miles in its dubious course, and starting from a little pool two feet in diameter in a wide marsh. That is where the furthest drop of the Mississippi flows from.

Death of the Locomotive.

A correspondent of *The Boston Herald*, writing from Altoona, Pa., with regard to the great work-shops of the Pennsylvania railroad and the wear of a locomotive, says: "The engine, once in service, is by no means lost sight of. Its movements are as thoroughly noted as those of an ocean steamer. In Mr. Ely's office in this city there is an immense board covered with little pegs, upon which hang small, round, colored disks, from the under part of which has been cut a small portion. These pegs and disks are numbered from 1 to 1,250. Each number corresponds with an engine. On one part of the board the pegs are numbered consecutively. Looking at this part for any particular engine that may be desired, and on the disk will be found, "Pigh," "N. Y." "P.," etc. This refers you to the division where the engine is. Looking to that division on the board and finding the number on the engine, another little disk, by means of its color, will tell you just what condition the engine is in. If the disk is pure white the engine is in perfect order. If the disk is bordered by a red line the engine needs only such slight repairs as may be made without withdrawing it from the service. If the disk is covered with half red, repairs are required of a very slight nature, but for which the engine must proceed to the shop. If the entire disk is pale gray, repairs of a most important character are needed, though still deemed slight. A disk entirely blue denotes a machine that needs very substantial repairs. One-half black and half white indicates the machine is being built over. A disk all black denotes an engine dead, unfit save to be cut up or sold. The record is changed every week and is so complete as to enable any one to see at a glance just the condition of the motive power. Repairs are never undertaken if they will cost over $3,000. For that a standard boiler can be built, and unless an engine is of the standard pattern she is never built over. For the company does not wish to perpetuate odd engines, and to pay more than $3,000 would not be so economical as to pay the interest on the value of a new machine. Here, again, true economy steps in to change the practice of blind conservatism. An engine on this road is always most carefully used. After the locomotive is placed in the hands of an engineer it is cared for with the watchfulness of a parent's affection. A most accurate record of its performance is made, kept and compared with that of other engines. As freight is paid for per ton per mile, so the cost of an engine is reckoned. The amount of coal consumed per car per engine mile being calculated, it is easy to see, by dividing this by the tonnage, just how much coal it takes to move a ton of freight one engine mile. And the engine that does this most successfully is the cheapest.

Finally, after having traveled many thousands of miles, having safely hauled millions of human beings, our locomotive is sent to the shop condemned, dead. It is ignominiously bundled off in a corner to stand with a lot of others until cut up or sold off. Its immediate neighbors may be others like itself, worn out, perhaps "dead in the harness," or again victims of the vain wrath and assassin-like communism of Pittsburgh rioters. The little disk that records in the superintendent's office its physical condition has turned to black. There is no hope. To-morrow a committee of inspection will condemn it to be cut in pieces. Into the furnace the parts will go, to emerge, like the old mill where old men were ground into new, rejuvenated, ready to take a place in some new monster with steel heart and transmigrated soul.

The Sewing Devil.

In the days when the sewing-machine was in its earliest infancy, a lady residing in India imported one, and for a long time kept its mysterious working hid from the ken of her native tailor. This functionary was the very slowest of his proverbial slow "caste," and wasted no end of time drawling over hem and stitch. One day his mistress came to him arm-laden with yards upon yards of some dress fabric. "Dirzie," says she, "how long will it take you to run these breadths together?" "Three days, missis," replies Dirzie. "Misses, please, plenty, too much work." "Three days! Nonsense! Three hours you mean. You are a very lazy man, and I'll cut your pay. Give me the stuff, I'll do it myself." Then the lady retires to her boudoir, from the inmost penetralia of which sharp and continuous click and whirr reached the tailor's ears. He can't make out what the sound is, and he is much too lazy to speculate on it. He continues to "chew betel," and yawningly to ply needle and thread. After an hour or two "Missis" comes back, and throwing at Mr. Dirzie's feet the raw material now fashioned into a complete skirt, says: "There! see! you wanted three days, you sleepy fellow, to finish this and I have done it already." Astonished, Dirzie turns over the drapery, examines the seam, scrutinizes the stitch, and satisfies himself that all is proper and according to tailors' rule. He is confounded. It passes his understanding. There lies the work and no mistake. But how? He springs up from the mat on which he has been squatting; he kicks over the little brass kettle which holds his drinking water; he scatters right and left thread, needle, thimble; he stops not to put on his sandals or to adjust loosened turban and waistcloth. Scared and bewildered, he runs for very life into the bazaar, shouting as he goes along: "Shitan, shitan! [The evil one, the evil one!] He do tailor business at Mem's house. I listen! I hear! He cry cleek, cleek, cleek. Two hour time he never stop cry. Den? Plenty too much true dis word I tell. Ebery bit true. All work done finished. I'll not go back dat bungalow." And he never did.—*Chamber's Journal.*

Didn't Say Anything to Him.

Extract from a woman's testimony in the trial of her husband for abusing her:

"He struck me in the face. I didn't say anything to him, but I gave him a good talking to."

The attorney scratched his chin a moment, and asked the woman if she would please repeat her statement.

"I say he struck me. I didn't say anything to him, but I gave him a good talking to."

Again the attorney scratched his chin, but finally told the woman to go on and tell what else had happened.

"That same afternoon he struck me again. I can stand a great deal, and I didn't say a word to him, but I gave him a good talking to."

The attorney thought long and deeply, and then asked:

"Did he strike you the third time?"

"Yes, sir, he did."

"Did you say anything to him?"

"No, sir."

"Not a word?"

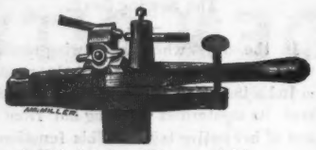
"Not a word."

"But perhaps you gave him a good talking to?"

"You can just bet your life I did."

The lawyer began to scratch his chin again but the judge dismissed the case.—*Cincinnati Enquirer.*

XUM



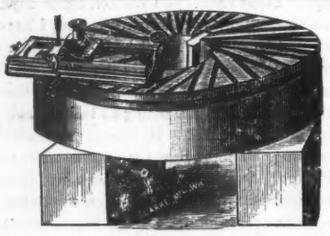
Harris' Lightning Diamond Sharpener

Every miller knows the value of keeping picks sharp, and it is just as essential to keep diamond points sharp, for the best of diamonds, after dressing from ten to twenty run of stone, should be sharpened to do good, clean cutting. The "Lightning Diamond Sharpener" will do this work speedily and effectually. Parties ordering will please give size and length of tool they use so that the sharpener can be made to fit such tool.

Price, $5.00.

Cash with order. Or, C. O. D. by express. Address,

J. B. HARRIS,
8-15t3 Ottawa, Ill.



IMPORTANT TO MILLERS!

BENTON'S PATENT

Diamond Mill Buhr Dresser

Adapted to fine, or coarse, light or heavy face, cracking, fleecing off smoothly, or furrowing level and true to any angle. It works perfectly, and is adjustable to all kinds of stone dressing required by millers. It saves time and money, improves the quality and quantity of the flour and makes a light offal.

The cost of mill picks, with the rubbing, grinding, tempering and express charges all saved by using this machine.

For particulars apply to

Benton Diamond Buhr Dresser Co.,
La Crosse, Wisconsin.

LIST OF PARTIES

Who have recently bought the Becker Wheat Brush:

E. P. Allis & Co., Milwaukee, Wis.; Nordyke & Marmon Co., Indianapolis, Ind.; Hoagland & Tresselt, Ft. Wayne, Ind.; M. E. Moore, Waterville, Kas.; Whitmore & Binyon, London, Eng.; W. Gilbreath, Elkville, Ill.; Jno. T. Noye & Sons, Buffalo, N. Y.; J. N. Smith & Bro., Brown's Mills, N. J.; Straub Mill Co., Cincinnati, O.; Sinker, Davis & Co., Indianapolis, Ind.; Thos. Bradford & Co.; Cincinnati, Ohio; U. S. Rexford, Fargo, Dakota; J. R. Van Meter, Van Meter, Iowa; C. H. Guenther, San Antonio, Texas; H. A. Hayden & Co., Jackson, Michigan; A. Millot, Zurich, Switzerland; John P. Dale & Co., Nashville, Tenn.

$300 A month guaranteed. $12 a day at home made by the industrious. Capital not required; we will start you. Men, women, boys and girls make money faster at work for us than at anything else. The work is light and pleasant, and such as any one can go right at. Those who are wise who see this notice will send us their addresses at once and see for themselves. Costly outfit and terms free. Those already at work are laying up large sums of money. Address.

TRUE & CO., Augusta, Maine.

WALKER'S
BELT TIGHTENER.

Indispensable for Safe and Economical Operation of Belts on Vertical Shaft and Spindle Pulleys. Prices reduced. Circulars free. Address GEO. WALKER, Box 222. Hamburg, Erie Co., N. Y.

John James & Co.,

Successors to

THORNELY & JAMES,

Machinists and Mill Furnishers.

Dealers in

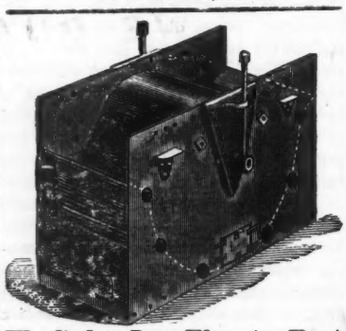
Belting, Bolting Cloth, and General Mill Supplies.

Manufacturers of

Craik's Turbine Water Wheel,
Craik's Pat. Bail, Driver & Balances
Dane's Improved Bail & Driver,
Benton's Diamond Buhr Dresser.

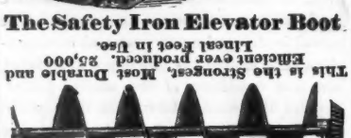
Plans and Specifications furnished on application.

Office and Works cor. Front & King Sts.,
11.22 LA CROSSE, WIS. ‡tf



The Safety Iron Elevator Boot

This is the Strongest, Most Durable and Efficient ever produced. 25,000 Lineal Feet in Use.



PATENT IRON CONVEYER.

These goods, of extraordinary merit and cheapness, together with all millan'g arehouse furnishings sold by

N. HAWKINS & CO., Supply House,
224 Washington St., Chicago.
☞ Send for Lists and Prices of needed articles

J.R.Cross,

PRACTICAL MILLWRIGHT AND MILL BUILDER.

Plans, Specifications and Estimates Furnished.

Dealer in All Kinds of

Flour Mill Machinery, Superior Bolting Cloth,

And Importer of

French Violet Stock

MILL STONES.

217 Washington Avenue, South,
MINNEAPOLIS.....MINN.

WARRANTED!!

LYE & ZIMERLE'S IMPROVED ANTI-INCRUSTATION COMPOUND FOR STEAM BOILERS.

We guarantee this preparation to neutralize the fresh deposits of lime and other mineral, thus stopping new formations of scale, and to gradually bring out the old scale. We earnestly solicit all users of steam to give it a trial.

Prices reduced to 50 cents per gallon in barrels, half-barrels and quarter-barrels. Correspondence solicited and references furnished. Please give diameter and length of boiler, well or river water, and kind of mineral as near as possible. Address,

LYE & ZIMERLE, Delphos, Ohio.

THE FAVORITE
Separator & Silent Feeder

Is the latest improved and BEST Wheat Cleaning Machine Made. It rids the grain from ALL SCREENINGS, DUST AND FOUL STUFF as it passes to the stone. It is a PERFECTLY EVEN FEEDER—not varied by expansion of spindle or raising and lowering the buhr. It is very

Beautifully Designed and of Ornamental Finish.

Price $30. Will ship to responsible parties on trial, and warrant to give **Entire Satisfaction or no Pay.** Send for Circular to

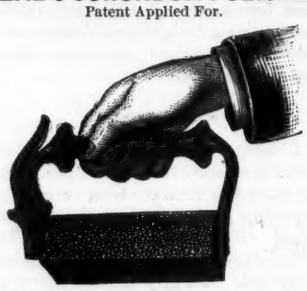
J. B. HUSTON & CO., Sole Proprietors, Aurora, Ill

BOLTING CLOTHS AND

All Kinds of Mill Machinery at Lowest Prices.

DEAL'S CORUNDUM POLISHER

Patent Applied For.



A Tool for Cutting, Leveling and Polishing the

FURROWS AND FACE OF MILL STONES.

For facing down high places on the buhr this tool has no equal, and can be done much better and in one-sixth the time than with the mill pick. The advantage this tool has over any other is, it is much larger, cuts better, can be used on either face or furrow; can be used until the corundum is entirely worn out on one side and then turned on the other side. Has over twice the amount of corundum, and when the corundum is worn out can be replaced in the handle at a small cost. We have been experimenting on Corundum Polishers for years, and we claim the best polisher in the world, which is backed by many of the best millers in the U. S. Millers who have used them say they would use no other. Sent post paid by mail for $4. By express $3.50. Satisfaction guaranteed or money refunded. Address:

HORACE DEAL, Manf'r, **Bucyrus, O.**

SERGEANT'S UNIVERSAL.
MILL BUHR DRIVER.

Before Getting Running Balance, and What to do.

1. Spindle to run true.
2. Bail to be set in the center and true with the face of RUNNER.
3. Standing balance on smarp point.
4. Running balance on grinding point.

Each of the above should be as true as the drive and backlash. This done we guarantee that the runner will not thump on the bed stone in STARTING, RUNNING or STOPPING. This driver works with common Bail. You can balance all the runners on one spindle, then any runner will run on any spindle in the mill. And you can if you wish have an extra runner, and by changing the runners it will help perfect the faces of both runner and bed stone. No fitting of irons is ever necessary. We make four sizes of Drivers.

THE ONLY UNIVERSAL DRIVER MADE.

Send for circulars and information. Reliable agents wanted. Address Sergeant's Mill Buhr Driver Company, box 383, Minneapolis, Minnesota.

JOHN C. HIGGINS,

Manufacturer and Dresser of

MILL PICKS

164 W. Kinzie Street,

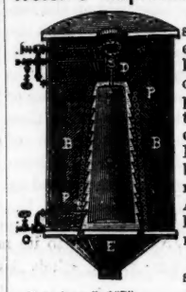
CHICAGO.

Picks will be sent on 30 or 60 days' trial, to any responsible miller in the United States or Canada, and if not superior in every respect to any other pick made in this or any other country, there will be no charge, and I will pay all express charges to and from Chicago. All my picks are made of a special steel, which is *manufactured expressly for me* at Sheffield, England. My customers can thus be assured of a good article, and share with me the profits of direct importation. References furnished from every state and territory in the U. S. and Canada. Send for Circular and Price List.

$66 A WEEK in your own town, and no capital risked. You can give the business a trial without expense. The best opportunity ever offered for those willing to work. You should try nothing else until you see for yourself what you can do at the business we offer. No room to explain here. You can devote all your time or only your spare time to the business, and make great pay for every hour that you work. Women make as much as men. Send for special private terms and particulars, which we mail free. $5 outfit free. Don't complain of hard times while you have such a chance.

Address H. HALLETT & CO., Portland, Maine.

Welch's Improved Wheat Heater.



The peculiar construction of this Heater insures the even heating of every grain of wheat. The wheat passes down between the notched cone and conical coil of pipe. B B is packed with Asbestos, which prevents radiation of the steam. A trial of 30 days allowed. Satisfaction or no sale.

Manufactured and sold by

Pat. Aug. 5, 1879. **A. B. BOWMAN,**
8.8wtf 703 Market St., St. Louis, Mo.

HIGH PRESSURE
MILL STONE VENTILATION.

Behrn's Patent.

The best and only reliable exhaust known. Nine years in successful operation.

OVER 8,200 IN USE.

No danger of explosion. Dry and cool grinding. Without any dust house. Easier and better bolting. No loss of flour dust. No formation of paste. Increased capacity of the buhrs.

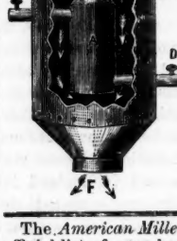
All the Big Mills in Minneapolis Use it.

Send for illustrated circular. Address,

J. R. CROSS, }
W. de la Barre, } Western Agents,
Box 360, Minneapolis, Minn.

BREHMER BROS., Mfr's, wtf
Cor. 12th and Noble Sts., Philadelphia.

THE ACME WHEAT STEAMER
Price, $15.00.



THE
Cheapest
AND THE
BEST!

This is by far the best and cheapest Wheat Steamer ever offered the milling public, and at a price so low as to place it within the reach of all millers. Strongly made and easily regulated; it steams and heats the berry evenly and perfectly. It is being used by many of our leading millers. tf

Send for circular.

GEO. W. McNEIL, Jr.,
a-1-wtf Akron, O.

The *American Miller* for April contains an official list of members of the Millers' National Association. On examining the list we find that it numbers over 700 firms, representing over 3,000 run of buhrs. We also find that over one-fourth of them, representing nearly 1,500 run of buhrs, are purchasers of our Diamond Mill Stone Dressers. They expect large additions to their membership—we also expect large additions to our list of purchasers, both from outside and inside of the association. Why? Because we have the best buhr dressers in the market.

GRISCOM & CO., Pottsville, Pa.

Manufacturers and owners of patents of McFeely's improved buhr dressers.

THE MILL OWNERS'

MUTUAL FIRE INSURANCE COMPANY

OF IOWA.

Organized in 1875.

OFFICERS:

J. J. SNOUFFER, President. J. G. SHARP, Secretary.
C. A. BRYAN, Vice-President. H. HAMMOND, Treasurer.

DIRECTORS:

J. R. SERRIN, Ladora. ROBERT NICHOLSON, Carlisle.
H. HAMMOND, Le Grand.
C. A. BRYAN, Agency City. D. A. TYRRELL, Des Moines.
R. T. BURNHAM, Clermont.
J. J. SNOUFFER, Cedar Rapids. S. D. NICHOLS, Panora.
J. G. SHARP, Wilton.

A FOUR YEARS' TEST of this Company has shown that it costs its Policy Holders LESS THAN ONE-HALF the rates charged by Stock Companies, besides giving the SAFEST KIND OF INSURANCE to its members.

☞No Agents employed to solicit Risks.

All who wish to avail themselves of the advantages offered by our Company, must address the Secretary.

Any information about the workings of our Company cheerfully given.

J. G. SHARP, Secretary,
Wilton Junction, Iowa.

RUSSELL & WILLFORD,

MANUFACTURERS OF THE CELEBRATED

MINNEAPOLIS

DOUBLE BLAST MIDDLINGS PURIFIERS,

MILL CURBS, REEL HEADS, AND CONVEYOR FLIGHTS.

CONTRACTORS FOR THE ERECTION OF

Flour and Grist Mills.

Specifications, Estimates and Plans furnished if desired. Agents for the Sale of

Buhr Mill Stones, Portable Mills. Flour Packers, Smut Machines,
Separators, Wheat Cleaning Machines,
THE MOST IMPROVED WATER WHEELS,
A full class of Furnishings for Steam or Water Power Mills.

Sole Agents for HENRY BODMER'S Bolting Cloths.

Office and Shop, 212 First Ave. S., - - - - MINNEAPOLIS, MINN.

CORUNDUM TOOL. Patented Jan. 23, 1877.

A Tool FOR CUTTING, LEVELING and POLISHING the FURROWS and FACE of MILL STONES. Many of the best mills in America are using them. For Facing down high places on the buhr this Tool has no equal, and can be done much better, and in one-sixth the time, than with the mill pick. Over 5,000 Millers using them, and the demand constantly increasing. Price $3.50; or sent by mail to any part of the United States, postpaid, for $3.85. Manfacutured by WEED & CO., Dayton, Ohio. nov9eowtf

$1500 To $6,000 a year, or $5 to $20 a day in your own locality. No risk. Women do as well as men. Many make more than the amount stated above. No one can fail to make money fast. Any one can do the work. You can make from 50 cents to $2 an hour by devoting your evenings and spare time to the business. It costs nothing to try the business. Nothing like it for money making ever offered before. Business pleasant and strictly honorable. Reader, if you want to know all about the best paying business before the public, send us your address and we will send you full particulars and private terms free; samples worth $5 also free; you can then make up your mind for yourself. Address,
GEORGE STINSON & CO., Portland, Maine.

THE GREEN MOUNTAIN

Turbine Water Wheel

is the best in the world for low falls and back water. Its great durability, *quick motion*, and great power make it the giant wheel of the age.

THE

SUNLIGHT

MILL DRESS

The finest dress in use, and will make the whitest and most flour and broadest bran of any dress known, and require less power.

Will guarantee to keep the face and furrows free from glaze for three cents per day, and clean a pasted mill in 15 minutes for three cents cost, with my discovery. Mill in motion, no wet stones, and a benefit to the product.

J. W. TRUAX, Essex Junction, Vermont.

THE VICTOR TURIBNE

is producing the best results on record.

We also continue to manufacture and sell at low prices the

ECLIPSE
Double Turbine.

State your requirements and send for Catalogue.

Stillwell & Bierce Manf'g Co
DAYTON, OHIO.
eowtf

THE GARDEN CITY

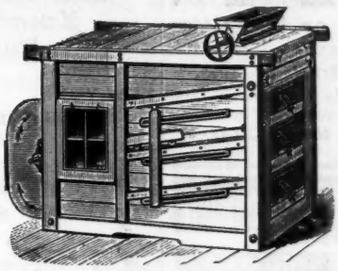
MIDDLINGS PURIFIER.

Fully Licensed Under All Existing Patents,

INCLUDING THOSE OWNED BY

The Consolidated Middlings Purifier Co.

OVER 2,000 IN USE.



SATISFACTION GUARANTEED.

It is designed for and is in use in many of our largest merchant mills, giving the most satisfactory results.

WE GUARANTEE

That one Garden City Purifier will do more and *better* work than any other single purifier in the world, hence it is peculiarly adapted for custom mills, where space is limited and it is desired to do all the work on one machine.

It occupies less space, requires less power to run it, and needs less attention when in operation than any other.

Highest Award at Centennial Exhibition,

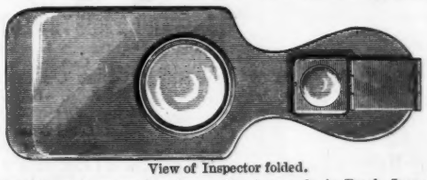
And in Fact

WHEREVER SHOWN.

Descriptive Circulars in English or German Mailed Free upon Application.

COLLINS & GATHMANN,
S. W. Cor. Washington and Clinton Sts.,
Chicago, Ill.

The Board of Trade Flour, Grain and Bolting Cloth Inspector.



View of Inspector folded.

Is well spoken of by all who have used and seen it. Are made in Pearl, Ivory, Celluloid and Silver. *Flour Triers of every Variety.*

Exclusive Controller and Introducer of the Handsome and Durable
CELLULOID FLOUR TRIERS:

in any color. A complete price list will be furnished on application. Wholesale and retail trade supplied.

H. J. DEAL, Bucyrus, Ohio,
or 35 Union Square, N.Y.
wtf

Great Western Manufacturing Company.

STEAM ENGINES AND MILL MACHINERY.

Established, 1858. Largest concern in the West. Best Cleaning Machinery, Buhrs, Leffel Wheels, Belting, Bolting Cloth, Pulleys, Shafting and Gearing. *Pipe, Brass Goods and Tools* always in stock. Promptness, Reliable Work, Low Prices. Catalogues and advice free.

James Leffel's Improved

Water Wheel.

PRICES GREATLY REDUCED for 1879.

The "OLD RELIABLE" with Improvements, making it the *Most Perfect Turbine now in Use*, comprising the *Largest* and the *Smallest* Wheels, under both the *Highest* and *Lowest* Heads used in this country. Our new Book for 1879 now in press, sent free. Address,

JAMES LEFFEL & CO., Springfield, Ohio, and 109 Liberty St., N. Y.
apr27eowtf

Perforated Metals.

Round, Square or Flat Holes

—IN—

Copper, Iron, Brass or Zinc.

Any width up to fifty inches wide, and all thicknesses up to one-sixteenth.

LIDGERWOOD MANF'G CO.,

6.27w26t 96 Liberty St., NEW YORK.

POOLE & HUNT, BALTIMORE.

MANUFACTURERS OF

THE POOLE & HUNT LEFFEL TURBINE

WATER WHEELS,

MACHINE MOULDED

MILL GEARING.

SHAFTING, PULLEYS AND HANGERS,

STEAM ENGINES AND BOILERS.

MIXERS FOR FERTILIZERS AND CHEMICALS.

SAMUEL CAREY,

17 Broadway NEW YORK,

IMPORTER

—OF—

Burr Stones

—AND—

Bolting Cloths!

Large Stock Always on Hand!

jan25'79w1y

THE THOMPSON

Turbine Water Wheel.

The most scientific application of the water ever made.

This Wheel Has No Superior in the World.

AWARDED

Bronze Medal and Diploma

—AT—

CENTENNIAL EXHIBITION.

Send for Descriptive Circulars. Address:

THOMPSON IRON WORKS,

1.10w52 Union City, P.

HOTEL!

The Nicollet House,

Minneapolis, Minnesota.

Having purchased this day the furniture and all interests of the late firm of McKibben & Vosburgh in the Nicollet House, we respectfully announce to the traveling public that we shall endeavor to restore and materially enhance the reputation which the house had under our former management, with the assurance that at the Nicollet will be found every requisite and comfort of a first class hotel. Prices graded from $2 to $3 per day.

F. S. GILSON & Co., Owners and proprietors.

Minneapolis, Aug 12, 1877. sep7tf

THE

Chicago, Milwaukee & St. Paul

RAILWAY

IS THE VERY BEST LINE TO

Chicago, Milwaukee,

St. Paul and Minneapolis,

AND ALL POINTS IN

Wisconsin,

Northern Iowa,

Minnesota, Dakota,

Manitoba, and the

Black Hills,

NEW YORK,

PHILADELPHIA,

BALTIMORE,

WASHINGTON.

New England, the Canadas, and all

EASTERN AND SOUTHERN POINTS.

2 ROUTES

—AND—

3 DAILY TRAINS

—BETWEEN—

Chicago, St. Paul and Minneapolis

The Chicago, Milwaukee and St. Paul Railway is the only Northwestern Line **connecting in same Depot in Chicago** with any of the Great Eastern and Southern Railways, and is the most conveniently located with reference to reaching any Depot, Hotel or place of business in that City.

Through Tickets and Through Baggage Checks to all Principal Cities.

Steel Rail Track, thoroughly ballasted, free from dust. **Westinghouse Improved Automatic Air Brake, Miller's Safety Platform and Couplings** on all Passenger cars. **The Finest Day Coaches and Palace Sleeping Cars**

This road connects more **Business Centers, Health and Pleasure Resorts**, and passes through a finer country with grander scenery, than any other Northwestern line,

A. V. H. CARPENTER,
Gen'l Pass. and Ticket Agt.

S. S. MERRILL, General Manager.

JOHN C. GAULT, Ass't Gen'l Manager.

Chicago, St. Paul & Minneapolis Ry.

(Formerly West Wisconsin,)

AND

CHICAGO & NORTHWESTERN RAILWAY,

Forming a Through Line without Change of Cars, between

ST. PAUL & CHICAGO, BELOIT, MADISON & BARABOO and making Close Connections at CHICAGO for NEW YORK, PHILADELPHIA, BALTIMORE, WASHINGTON, NEW ENGLAND, THE CANADAS and all EASTERN and SOUTHERN STATES.

It is the ONLY LINE running

PULLMAN PALACE CARS

And making direct connections with St. Paul & Pacific, Northern Pacific, and St. Paul & Duluth Railways.

IN UNION DEPOT AT ST. PAUL.

STEEL RAIL TRACK, thoroughly ballasted and free from dust; WESTINGHOUSE AIR BRAKE, MILLER SAFETY PLATFORMS and COUPLINGS on all Passenger Cars.

NEW AND ELEGANT DAY COACHES

In connection with

Pullman Palace Cars!

ON ALL TRAINS.

Two Through Express Trains Daily.

CONNECTIONS.

AT MERRILLAN JUNCTION, for Green Bay, Grand Rapids, Fond du Lac, Appleton, Oshkosh, and all points on Northern Lake Michigan.

AT WIS. VALLEY JUNCTION, for Stevens Point, Wausau, and all points on Wisconsin Central Railroad.

DON'T FORGET

to PURCHASE TICKETS via.

Chicago, St. Paul & Minneapolis and Chicago & Northwestern Railways,

in order to save expense, trouble and annoyance incident to transfer of baggage at St. Paul, and enjoy the

BEAUTIFUL SCENERY

OF THE

St. Croix & Baraboo Valleys,

Including DEVIL'S LAKE, MADISON, and BELOIT, WISCONSIN.

F. B. CLARKE, Traffic Manager. St. Paul.

W. H. WINTER, Gen'l Sup't. Hudson, Wis

Toll Cards

With table for taking one-eighth toll and making ample deduction for cleaning, etc. Grists figured out in a few seconds at any number of pounds of flour per bushel. Two for 50 cts; 5 for $1. LORD BROS., Waupaca, Wis.

The Chicago & Northwestern Railway

IS THE

Oldest, Best Constructed Most Progressive, best Equipped, Hence

THE MOST RELIABLE RAILWAY CORPORATION

Of the Great West.

It is to-day, and will long remain the

Leading Railway of the West and Northwest.

It embraces under one Management

2,158 Miles of Road

And forms the following Trunk Lines:

"CHICAGO, COUNCIL BLUFFS & CALIFORNIA LINE,"
"CHICAGO, CLINTON, DUBUQUE & LACROSSE LINE,"
"CHICAGO, SIOUX CITY & YANKTON LINE,"
"CHICAGO, FREEPORT & DUBUQUE LINE,"
"CHICAGO, LA CROSSE, WINONA & MINNESOTA LINE,"
"CHICAGO, GREEN BAY & MARQUETTE LINE."
"CHICAGO, MILWAUKEE & LAKE SUPERIOR LINE,"
"CHICAGO, ST. PAUL & MINNEAPOLIS LINE,"

The advantages of these lines are

1. If the passenger is going to or from any points in the entire West and Northwest, he can buy his tickets via some of this Company's lines and be sure of reaching his destination BY IT OR ITS CONNECTIONS.
2. The greater part of its lines are laid with Steel Rails; its road bed is perfect.
3. It is the short line between all important points.
4. Its trains are equipped with the Westinghouse Air Brake, Miller's Platform and Couplers, and the latest improvements for comfort, safety and convenience.
5. It is the only road in the West running the celebrated Pullman Hotel Cars between Chicago and Council Bluffs.
6. It is the only road running the Pullman Palace Sleeping Cars either way between

Chicago and St. Paul, Green Bay, Freeport La Crosse, Winona, Dubuque, McGregor, Milwaukee.

7. No road offers equal facilities in number of through trains, equipped with Pullman Palace Sleeping Cars.
8. It makes connections with all lines crossing at intermediate points.

The popularity of these lines is steadily increasing and passengers should consult their interest by purchasing tickets via this line.

Tickets over this route are sold by all Coupon Ticket Agents in the United States and Canadas.

Remember, you ask for your tickets via the Chicago, & Northwestern Railway, and take none other.

For information, Folders, Maps, etc., not obtainable at Home Ticket Office, address any agent of the Company or

MARVIN HUGHITT, Gen'l Manager, Chicago.

W. H. STENNETT, Gen'l Pass. Ag't, Chicago.

St. Louis, Minneapolis & St. Paul

SHORT LINE,

Composed of the

MINNEAPOLIS AND ST. LOUIS,

BURLINGTON,

CEDAR RAPIDS and NORTHERN,

—AND—

Chicago, Burlington & Quincy

RAILWAYS,

Making the Shortest Line and the Best Time between SAINT. LOUIS,

and all points in the South, Southwest and Southeast,

MINNEAPOLIS AND ST. PAUL,

The Summer Resorts and Lake Country

(Most prominent of which are Lake Minnetonka and White Bear Lake) of the Northwest, and Great Lakes

Also New and Direct Line Between

Minneapolis, St. Paul and Chicago

In connection with the

CHICAGO & NORTHWESTERN R'Y

Via Cedar Rapids to and from

CHICAGO, NEW YORK, BOSTON, PHILADELPHIA, And all points East.

Tickets on sale at all the important Coupon Ticket Stations throughout the South, East and West.

PULLMAN PALACE SLEEPING CARS

of latest make and improvements on through express trains.

BAGGAGE CHECKED THROUGH.

TWO DAILY TRAINS EACH WAY.

Tickets and Sleeping Car Berths can be secured in

MINNEAPOLIS,

at City Ticket Office, No. 8 Washington Ave.,

W. G. TELFER, Agent.

And at St. Paul and Pacific Depot.

In St. Paul at 116 East Third Street,

G. H. HAZZARD, Agent.

In St. Louis, 112 North Fourth Street,

C. SANDERS, Agent.

IN CHICAGO, at all Ticket Offices of the Chicago and Northwestern Railway.

C. F. HATCH, Gen'l Manager.

A. H. BODE, Gen'l Pass. Agt

A. H. Kirk,

Manufacturer and Dealer in

Mill Furnishings.

PLANS AND SPECIFICATIONS MADE ON APPLICATION.

OFFICE and SHOPS, Cor. 6th Ave S. and 2d St.

MINNEAPOLIS, MINN.

Water Wheel has been run against the so-called "best" wheels in the world. In tests made upon condition that the losing party should forfeit their wheels, James Leffel and the Delphos Company failed in competition with the EUREKA.

Middlings Purifier, Free from Danger of Patent Suits.

Do not Purchase a Purifier until you have examined the Improved Wolf's Patent. No agents employed.

Double Machines...$150. Single Machines...$100

Send for price lists to

A. N. WOLF,

8-1w5 Allentown, Pa.

:RAILROAD TIME TABLES.

Chicago, Milwaukee & St. Paul R'v.

LEAVE MINNEAPOLIS.

Through Eastern and Southern express	*11:35 a m / $7:05 p m
Prairie du Chien, Milwaukee and Chicago express	*6:30 a m
Austin Mason City and Ottumwa express	*6:30 a m
Glencoe, Granite Falls and Montevideo express	*6:30 a m
St. Louis and Kansas City express	†8:20 p m
Sioux City and Omaha express	*2:50 p m
Owatonna accommodation	*4:10 p m

ARRIVE AT MINNEAPOLIS.

Through Eastern and Southern express	†7:00 a m / §2:22 p m
Prairie du Chien, Milwaukee and Chicago express	*6:30 p m
Austin, Mason City and Ottumwa express	*6:30 p m
Glencoe, Granite Falls and Montevideo express	*6:30 p m
St. Louis and Kansas City express	‡7:00 a m
Sioux City and Omaha express	*12:40 a m
Owatonna accommodation	*9:30 a m

*Sunday excepted; †Saturday excepted; ‡Monday excepted; §Daily.

Chicago and Northwestern Railroad.

Depot—Washington Ave. and Dakota St. Ticket offices—No. 13 Nicollet House block, and St. Paul & Pacific depot.

LEAVE MINNEAPOLIS.—Through Chicago and Eastern express *11:45 a m and 16:35 p m.

ARRIVE AT MINNEAPOLIS.—Through Chicago and Eastern express ‡7:40 a m and †1:50 p m.

*Sundays excepted; †Daily; ‡Mondays excepted.

Connections made at Camp Douglas for Milwaukee.

Chicago, Clinton, Dubuque & Minn. R. R.

GOING NORTH.

Chicago [C. & N-W Railway]	leave	10:30 a m	leave	9:15 p m
St. Louis [C. B. & Q. Ry.]	do	8:00 a m	do	8:45 p m
Rock Island	do	8:55 a m	do	9:40 p m
Clinton	do	3:17 a m	do	4:12 p m
Sabula	do	4:22 a m	do	5:09 p m
Bellevue	do	5:27 a m	do	6:24 p m
Dubuque	arrive	6:45 a m		
	leave	8:00 a m	arrive	7:32 p m
Guttenberg	do	10:05 a m		
McGregor	do	11:03 a m		
Waukon Junction	do	11:40 a m		
Lansing			leave	1:12 p m
Brownsville			do	2 40 p m
La Crosse			arrive	3:45 p m

GOING SOUTH.

La Crosse			leave	12:48 p m
Brownsville			do	1:50 p m
Lansing			do	3:15 p m
Waukon Junction			do	4:21 p m
McGregor			do	5:00 p m
Guttenburg			do	5:58 p m
Dubuque			arrive	7:47 p m
	leave	6:15 a m	leave	9:10 p m
Bellevue	do	7:26 a m	do	10:25 p m
Sabula	do	8:25 a m	do	11:30 p m
Clinton	arrive	12:40 a m	arrive	9:27 a m
Rock Island [C. B. & Q. Ry]	do	5:00 a m	do	7:00 p m
St. Louis [C. B. & Q. Ry.]	do	7:15 a m	do	6:00 p m
Chicago [C. & N.W.]	do	7:15 a m	do	3:40 p m

Turkey River Branch.

Train leaves Wadena 6 a m; Turkey River 10.50 a m; arrives at Dubuque 1.20 p m. Leaves Dubuque 2.40 p m; Turkey River 5.10 p m; arrives at Wadena 9.40 p m.

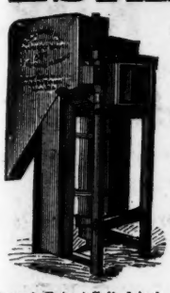
Waukon & Mississippi R. R.

Trains leave Waukon at 8 a m and 2.15 p m; arrive at Waukon Junction at 10.25 a m and 4.20 p m. Leave Waukon Junction at 11.45 a m and 5 p m; arrive at Waukon at 12.40 p m and 7.20 p m.

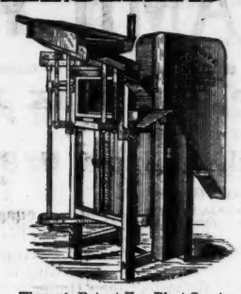
Pullman Palace cars run on trains between McGregor and Chicago, and between Dubuque and Rock Island.

F. O. WYATT, Gen. Manager.

ESTABLISHED IN 1854.



Throop's Patent Cylindrical Brush Finishing Machine. Five sizes and Three Patents.



Throop's Patent Fan Blast Smut and Separating Machine, with Shoe. Six sizes and Four Patents.

Throop's Patent Cone-Shaped Brush Finishing Machine. Five sizes and Three Patents.

We would call your attention here to the Grain Cleaning Machines illustrated, having spared no pains or expense in keeping them up to the highest standard in Milling Improvements. We can now furnish those who prefer a Cone-Shaped Brush machine, with our patent contracting adjusting case, enabling the user to adjust the case as desired while the Brush is in motion.

We are also prepared to furnish the Milling Public with the most complete and durable Chilled Iron Roller Mills and Centrifugal Flour Dressing Machine now in the market. We have largely reduced prices, and our aim in the future, as in the past, is to continue to improve and spare no pains to keep our machines up with the times.

Send for our new Illustrated Price List. Address:

THROOP'S GRAIN CLEANER CO., Auburn, N. Y.

6 27wtf J. W. Throop, 5 Aldersgate St., London, E. C., European Agt.

Wm. RICHMOND, Lockport, New York.

MANUFACTURER OF

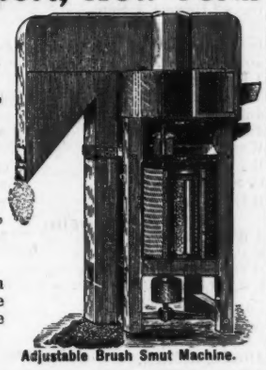
RICHMOND'S CELEBRATED

Smut Machines, Brush Machines, Grain Separators, and Bran Dusters.

All of the mills built last year in Minneapolis, Minn., use the Richmond machines exclusively.

Sixty-five of these machines are now in operation in the city of Minneapolis alone. Twenty-six in the city of Milwaukee, Wis., and are also in use in like proportion in other leading milling points.

SEND FOR DESCRIPTIVE CIRCULAR.



Adjustable Brush Smut Machine.

THE DANE
MILL BUHR DRIVER

It produces better results than any Driver in use. Send for circular to

J. C. Dane, or *John James & Co.*,

3-14wtf La Crosse, Wis.

PENINSULA STONE CO.

Having assumed the control of this famous quarry, the undersigned is prepared to furnish on short notice a superior quality of sharp, fine grit sandstones for ENDING WHEAT AND HULLING OATS.

Send for price list.

FERD. SCHUMACHER, Pres.

Akron, Ohio.

BOOKWALTER ENGINE.

Compact, Substantial, Economical, and Easily Managed. Guaranteed to work well, and give full power claimed. Engine and Boiler complete, including Governor, Pump, etc., (and boxing) at the low price of

3-Horse Power - - $215.00
4½ " " - - - 245.00
6½ " " - - - 315.00

Put on cars at Springfield, O.

JAMES LEFFEL & Co., Springfield, Ohio

For Truing the Face and Furrows of Millstones, Cutting down high Spots, and restoring the Burrs to their natural grit, it is far superior to **EMERY, CORUNDUM,** or any other material that has yet been used for this purpose. It is the only Tool used with **Water.** Cuts faster, lasts longer, and will remove the **glaze** in one-half the time it takes with other Hand Tools. Too large to send by mail. **Price, $3.50.**

MORRISVILLE, Bucks Co., Pa.

Messrs. TETER & ALLEN, Philada., Pa.—We gave your Black Diamond Hand Tools a fair trial. They are far superior to the Corundum Tool, cuts much faster and leaves a smoother surface, and still preserves the natural grit of the stone. Respectfully, HOWELL & SON.

Sold by Mill Furnishers throughout the United States and Canadas.

TETER & ALLEN, Proprietors,

DEALERS IN FLOUR MILL SUPPLIES.

404 Commerce St. Phila., Pa., U.S.A

ESTABLISHED 1837

VICTOR BISHOP & CO.

IMPORTERS OF

DIAMONDS AND CARBON FOR MILLSTONE DRESSERS

47 NASSAU ST. NEW YORK

Otis A. Pray. A. L. Miner. Chas. Evans

THE MINNEAPOLIS IRON WORKS.

O. A. PRAY & CO.,

Cor. 1st St. and 5th Ave. South, MINNEAPOLIS, MINN.

We deal in, furnish and manufacture everything required in a Mill, and always strive to keep on hand the best of its kind in every department.

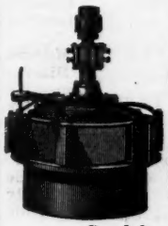
MILL FURNISHING

And Millwright Work a Specialty.

Contracts made for the whole or any part of a mill.

Crusher Rolls, Wheat Heaters, Du Four's Bolting Cloth, Belting, Etc.

Castings of all Kinds. General Machinery of all Kinds.



THE

American Turbine Water Wheel

IN ACTUAL PRACTICE THE

BEST WATER WHEEL IN THE WORLD.

Send for Circular and particulars to

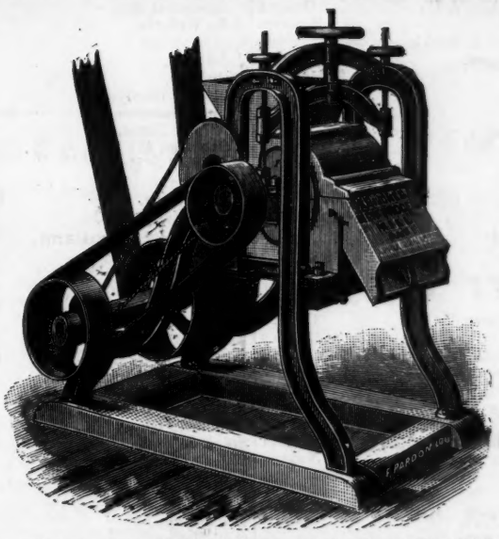
O. A. PRAY & CO.,

Cor. 1st St. and 5th Ave. South, *Minneapolis, Minn.*

JAMES JONES'

NEW PROCESS MILL

The Best Granulating Mill YET INVENTED.



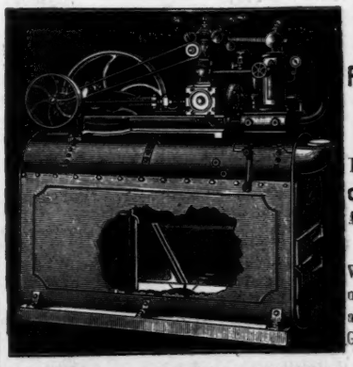
Every Mill Guaranteed to Work AS REPRESENTED.

SEND FOR CIRCULAR AND PRICE LIST.

Address: **JAMES JONES,**

Patentee and Manufacturer,

114 E. Main St., **Louisville, Ky.**



THE SKINNER

Portable & Stationary Engines

BOILERS AND GOVERNORS.

2 1-2 to 15 Horse Power

These engines are especially adapted to

GRAIN ELEVATORS AND MILLS,

And the many in use for this purpose testify to their excellence.

We refer to C. A. PILLSBURY & CO., Minneapolis; PRATT & ROBINSON, Faribault, and BASSETT, HUNTING & CO., McGregor, Iowa, the latter now using fourteen.

They are STRONG, SIMPLE, DURABLE, and have many new improvements. Send for Circular and Prices to

SKINNER & WOOD, Erie, Pa.

BECKER BRUSH FAMILY.

This Family of Millers are Happy and Prosperous in the use of that

"OLD RELIABLE SWEEPSTAKES."

THE BECKER BRUSH, Made and Sold by the

EUREKA MANUFACTURING COMPANY, Rock Falls, Illinois, U. S.

An Invitation is Extended to all Millers to Join this Band of Brothers.

Illinois.

Wm. C. Black & Co.	Sycamore
Wood Bros.	Dixon
Black Bros.	Polo
W. H. Osborn & Co.	Quincy
Bagby & Graves,	"
Halliday Brothers,	Cairo
Robert Adams,	"
Gage &Chilton,	Charleston
Bowers & Co.	Danville
Bowers & Co.	"
Lash & Co.	"
J. C. Berlien,	Chicago
State Flouring Mills,	"
Chisholm Brothers,	"
Wm. F. Noye,	"
A. Plamondon & Co.	"
Hannah, Lay & Co.	"
McAdams & Bleyler	East Newburn
Church & Patterson	Sterling
Williams & Orton Manfg. Co	"
A S Cox & Co	Rochelle
Crossley & Halloway,	Princeton
W J Gage & Son	Okawville
Johnson & Hubbard	Lyndon
A L Lovell	Cortland
Cave, Lancaster & Co	Girard
Guill & Coke	Martinville
G W Cooper	"
Geo W Wells	Seehorn
Hyde & Colvin	Kinderhook
Wells & Burt	Pittsfield
Bennett Brothers & Co	Geneva
J Richmond,	Mattoon
Dill, Redmond & Buckley,	Paris
Wm H Geohegan,	"
J D Sage,	Bridgeport
N P Tinsley,	Macomb
L Pitkin,	Belvidere
A L Byers,	Olney
Merom Bluff Mill Co	Huttonsville
R B Elliot,	Coultersville
F P Lichey,	Paw Paw
J C Boyle,	Sparta
Gill & Ford,	Murphysboro
Yantis & Cory,	"
F Richards,	Elgin
Crown Mills,	Belleville
E Albers & Co,	Warsaw
C F Sheets,	Oregon
Bmmons & Darrald,	Ottawa
R J Haines,	St Charles
Ross & Warren,	Tower Hill
J W Bingham & Co,	Pontiac
A Water & Co,	Canton
Dillon & Carpenter,	Carpentersville
Union Mill Co,	Bloomington
E Doan & Son,	New Salem
Peter Welter,	Nauvoo

Missouri.

E Norton & Son,	Troy
Kehlor Bros,	St Louis
Fath, Ewald & Co,	"
G & W Todd & Co,	"
Yeager Milling Co,	"
Atlantic Milling Co,	"
Carter, Prindell & Co,	Hannibal
Perkins, Carter & Co,	"
Louis Schaof & Co,	St Mary's
Whitmore Bros,	St Joe
G C Thilenius,	Cape Girardeau
Hauck & Brother,	St Joseph
R T Davis,	"
John S Crow & Bro,	Paris
Huggins Bros & Co,	Palmyra
S P Wemple,	"
John R Hamacher,	Richmond
Cowgill & West,	Carthage
Biehle & Yæger,	Perryville
Conrad Jordan & Co,	Nevada
Hobrecht & Co,	Sedalia
Frank Clark,	Hamilton
Hooker, Jones & Co,	Blue Springs

Ohio.

Reuben Keller,	Tiffin
W L Wells,	New Vienna
Wm. Carson & Co,	Chillicothe
Jacob Blosser,	"
J S Rider & Co,	Canton
Jos. Kratochwill,	Dayton
Simon Gebhart & Sons,	"
Warder & Barnett,	Springfield
Barney, Dumas & Co,	Roscoe
Cuykendall & Seiler,	Fredricktown
John Boehm,	Monroeville
John Damp & Co	Ashland
J W Bradford	Harrison
Goble, Hum & Co	East Palestine
Davis Bush	Cincinnati
H Nagel	"
Dillon, Gorman & Co	"
Bourneville Milling Co	Bourneville
D R Stewart	Cedarville
Death & Clutch	Franklin
J W Carr & Son	Hamilton
Wm Anderson & Co	"
Davis & Baxter	Malvern
Henry Welhelm	Minerva
Applegate & Martin	Zanesville
Hurlburt & Paige	Painesville
A J Klinger	Greenville
Staley & Baxter	Mechanicsburg
Coolville Steam Mill Co	Coolville
Christman & Melser	Waterville
Unity Mill Co	West Unity
W H Bruns	Woodville

Michigan.

Hannah, Lay & Co,	Traverse City
Merrill & McCourtie,	Kalamazoo
Wm Merritt,	Battle Creek
H H & D F Dantz,	Plainwell
Hibbard Rose & Co,	Grand Rapids
A X Cary & Co,	"
R B Smith,	Portland
Perrien Bros,	Detroit
Hatch & Mansfield,	"
Detroit Central Mill,	"
Henkel & Voorhees,	"
Commercial Mills,	"
John Webster,	"
Geo Snowden	"
John Clee,	"
Hale Bros,	Lyons
Barlow & Goodyear,	Hastings
John S Marsters,	Newburg Mills
Dexter & Noble,	Elk Rapids
A Sherman & Co,	Paw Paw
McDonald & Fray,	Bay City
A J Baker,	Janesville
O G Stebbins.	Vermontville
Kollen, Kepple & Co,	Hamilton

Indiana.

John R Evertson,	Mt. Vernon
Merom Bluff Mill Co,	Merom
C & E Hawks,	Goshen
R L Thompson,	Terre Haute
Wm Paddock & Co,	"
Adams & Creal,	"
D & T M Gibson,	Indianapolis
Nordyke & Marmon Co,	"
N Weber	La Porte
A & J Loomis,	South Bend
Knoblock, Ginz & Co,	"
Spink & Veale,	Washington
Bates & Leeds,	Liberty
J W Talbot,	Rising Sun
Gray Brothers,	Waynetown
Louis Fagin,	Vincennes
G W McCune,	Montezuma
McClure, Bateman & Co,	"
Richmond City Mill Works,	Richmond
Ludlow, McGill & Co,	Portland
Droge & Donselman,	Aurora
John J Klinger,	Peru
Jacob Bohm,	Carbon
Ralph & Sprague,	"
J Johnson & Co,	Lawrenceburg
Holmes & Frey,	Seymour
Attica Mill Co,	Attica
Montgomery & Son,	Greensburg
McClure & Co,	Metamora
Andrew Murray	"
T Hudson,	La Grange
Harris & Co,	Greencastle
Oregon Mill Co,	New Harmony
Mr Snyder,	Otis
J E Loughry & Co,	Monticello

Minnesota.

G H Christian & Co,	Minneapolis
Day, Rollins & Co,	"
O A Pray,	"
Chas A Pillsbury & Co,	"
J W Johnson,	"
Harn & Snyder,	Faribault
Cannon City Mill Co,	"
Morristown Mill Co,	"
O Troost,	Winona
White & Edwards,	Hokah
H Ridell & Co,	Owatonna
Taopi Mill Co,	Taopi
John T Fisher,	Janesville
H C Wait,	St. Cloud
Dickson, Easton & Johnson,	Fountain
Farmers' Mill Co,	Swede Grove
Barclay & Wallace,	Warsaw
John B Downer,	Wabasha
N A Redding,	Houston
Schaller Brothers,	Brownsville
Moorhead Mfg Co,	Moorhead
John M Cole,	Rochester
Ole Dusscher	Lanesboro
Gardner & Moore,	Hastings
Edward Hill,	Spring Valley
Grange Mill Co,	Northfield
Jacob Pfaff & Co,	Winnebago Agency

Maryland.

Isaac Pennington,	Frederick City
Joseph Cronise,	"
T W Levering & McAttee,	Baltimore
C A Gambrill &Co,	"
Ezra Valentine,	"
Seevers & Anderson,	"
W E Woodyear & Co,	"
J Q A Kemp,	Breathedsville
N Fiery & Co,	Hagerstown
H F Lehman	"
Daniel Huyett & Son,	"
W W Sprecher,	"
H F Neikirk,	Keedysville
John M Snook,	Middleton
J E Cartzendafner,	Frederick
James S Gladhill,	"
John Heck,	"
John L Nicodemus,	Eakles Mills
Wm H C Kemp,	Williamsport
B F Shriver,	Westminister
C. S. Simmonds,	Buckeytown
R C Johnson,	Cumberland

Wisconsin.

J B A Kern,	Milwaukee
E P Allis & Co,	"
H Curtis & Co,	"
E Sanderson & Co,	"
Partridge & Wells,	"
Andrews & Co,	Hudson
J C Bowman,	"
Allen & Aldrich,	Fond Du Lac
A Syme & Co,	Menasha
Daniel Shaw Lumber Co,	Eau Claire
S M Newton & Co,	"
B Boorman,	Mauston
S W Searles,	Clinton Junction
Gilbert & Barber	Geneva
A W Potter & Co,	Neenah
A J Russell,	Rochester
Thos Smith,	Green Bay
W H Stacy,	Clintonville
Schroeder & Trottman,	Cedarburg

Iowa.

Shepard & Perrior,	Des Moines
C L McNamee & Son,	Village Creek
G H Rice & Co	Osage
William Funk,	Keosauqua
J C Hoffmayer,	Council Bluffs
C G Mullikin	Lansing
S L Berkley & Co,	Missouri Valley
Fleck & Bros,	Guttenberg
G C Dellinger,	Pearl Rock
B Schwarting,	Wolcott
Independence Mill Co,	Independence
V F Weiser,	"
H R Grape,	Hamburg
B F Crenshaw,	Tama City
Abram Stanly,	Albion
E Conant,	Clinton
White & Moor,	Cresco
Jas Taylor & Son,	Humiston
Wm Bradley	Centerville
Eastman & Laird,	Nashua
S F McDonald	Oxford Mills

Kansas.

Perry Hutchinson,	Marysville
Shellbarger & Griswold,	Topeka
Howard & Greenman,	Waterville
Olmstead Brothers,	Blue Rapids
E B Percell,	Manhattan
Drinkwater & Schriver,	Cedar Grove
O W Baldwin,	Ottawa
Miller & Burt,	Oswego
W H Graham,	Rocky Hill

Tennessee.

M A Clee,	Chattanooga
John P Dall,	Nashville
D H Caswell & Co,	"
Samuel Lyon,	Gallatin
J W Walton,	"
Cannon & Son,	Bell's Depot

Pennsylvania

John S Detwiler & Co,	Philadelphia
Samuel Hartranft,	"
Seager, King & Co,	Allentown
John Hoffer,	Harrisburg
Joseph A Delaney,	Hatborough
W P Duncan & Co,	Bellefonte
Hays & Co,	Lock Haven
Benjamin Stauffer,	Greencastle
C Burkhart,	Chambersburg
Wood, Morrell & Co,	Holidaysburg
David Kreider,	Annville
Joel Wenger,	Akron
Henry Snavely,	Lancaster Junction
John C Motz,	Laureltown
Oliver & Bacon,	Erie
E Scouller,	North East
Shick & Wamsher,	Port Clinton
J M Brandt,	Mt. Joy

Kentucky.

Ferguson, Smith & Co,	Louisville
W D Pyne,	"
J Campbell & Co,	Covington
Deglow & Bausch,	"
John Miller & Co,	"
William Shaw,	Paris
E F Spears,	"
N Long & Co,	Russelville
Peck, Potts & Co,	Cynthiana
Chas M Slocum,	Mount Sterling
Bryant & Bro,	Guthrie
D E Roberts,	Mayville

Virginia.

Lyman & Co,	Norfolk
J B Ficklen & Son,	Fredericksburg
Haxall, Crenshaw & Co,	Richmond
Baker & Co,	Winchester
S C Hurt & Son,	Lynchburg
J T Jenny.	Occoquan
Ira B Cultrane,	Max Meadows

New York.

G F Mills & Co,	Fonda
John S Cary,	Howe's Grove
Houser & Roberts,	Fredonia
Zieley & Vickers,	Palmyra
Jas Norbury,	Middletown
W H Woodhull,	Fairport
J T Noye & Sons,	Buffalo

New Jersey.

John Baird,	Belvidere
A J Morris,	Pemberton
E V Kennedy,	Tranquility
Chas H Snyder,	Manalapan
Chas Walton & Son	Trenton
Henry Miller	Morristown

Colorado.

Hottell & Mason,	Fort Collins
O F Barker	Golden
La Veta Mill Co,	La Veta
A J Hager & Co,	Cannon City
S S Kennedy & Co,	Greeley
D K & J Sternberg,	Boulder

Miscellaneous.

D W Knight,	Providence, R I
W H Tenney,	Georgetown, D C
John Bangs,	Springfield, Mass
R J Woods,	Eufaula, Ala
Nevada State Mill Co,	Reno, Na.
R F Soady & Co,	Columbus, Miss

Canada.

W G Oglivie & Co,	Montreal
Thomas Pringle,	"
Goldie & McCullough,	Galt
Wm. Greey,	Toronto

Nebraska.

Schmiske & Reiber,	Nebraska City
Becker & Welch,	Columbus
Thos L Hallam,	Glen Rock Mills
Geo Homewood,	Sheridan

Texas.

A S Clark,	Hutchinson
C S Mitchell & Co,	Dallas
Hallernd & Carter,	Fort Worth
Texas Star Mill Co,	Galveston

Delaware.

Jas. L. Heverin,	Dover
Lodge & Valentine,	Wilmington
J B Deakyne,	Middletown

Georgia.

J J Cohen & Son,	Rome
G W Woodruff,	Columbus
D B Cade,	Washington

Utah.

Geo A Lowe,	Salt Lake
Joel Grover,	Nephi City

SEND YOUR ORDERS TO THE

EUREKA MANF'G CO., Rock Falls, Ill., U. S. A.

B. F. GUMP.

53 South Canal St., Chicago,

General Mill Furnisher,

Commission Merchant,

And Sole Agent in Chicago for the Celebrated

DU FOUR & CO. BOLTING CLOTHS.

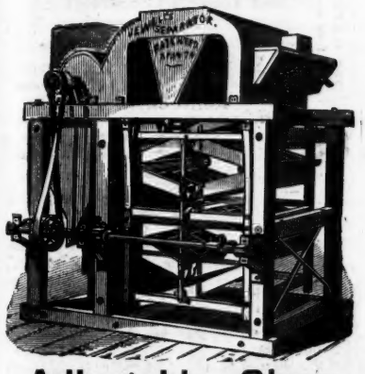
(I HANDLE NO OTHER BRAND.)

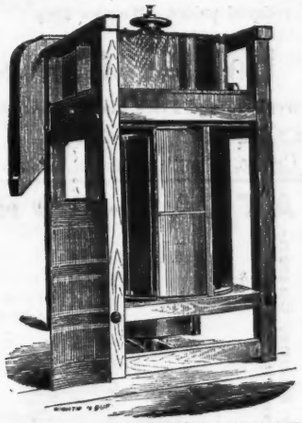
All numbers kept constantly in stock to supply any order at a moment's notice. *Grit Gauze Cloths,* equal in mesh, from 000 to 6, inclusive, always on hand.

Flour Mill Trimmings a Specialty.

Beltings, Elevator Buckets, Wire Cloths, etc. Smutters, Corn Shellers, Portable Mills, and all articles necessary for mills, at prices to suit the times. **Send in your Orders.**

THE JEWELL





Adjustable Sieve OAT AND COCKLE SEPARATOR.

Rakes' ADJUSTABLE BEATER AND BRUSH SMUT MACHINE.

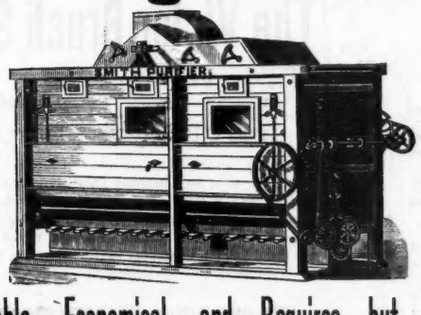
Upright and Horizontal Bran Dusters.

Send for Circulars and Price List to

C. RAKES,

Lockport, - - New York.

THE GEO. T. SMITH IMPROVED Middlings Purifier.



Simple, Durable, Economical, and Requires but Little Power.

Purifies Middlings or Returns from Hard Spring or Soft Winter Wheat thoroughly and without waste.

Has the Traveling Brush, the Sectional Draught, the Pockets, and many other important features.

A large number are in use in the successful New Process mills of this country.

We manufacture eight sizes, adapted to the smallest or largest mills. Our prices range from $225 to $600, and carry a license under all of the patents owned by the Consolidated Middlings Purifier Company.

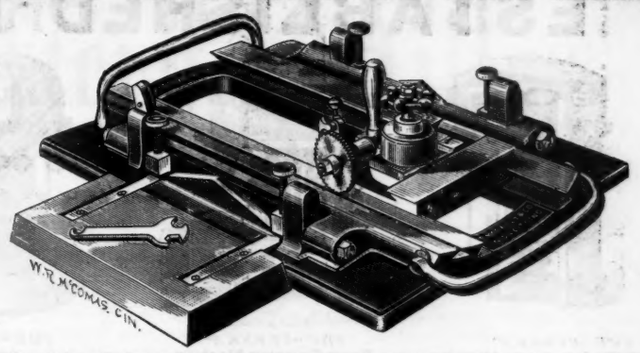
Send for our new Circular and Price List, with references.

Address the manufacturers,

GEO. T. SMITH MIDDLINGS PURIFIER CO,

Jackson, Michigan.

McFEELY'S NEW FURROWING AND FACING MACHINE.



Used in all the mills in Minneapolis, and all the Best mills in Minnesota. For Prices, Etc., Address,

a1-2 **Thos. McFEELY,** Inventor, **Union City, Ind.**

The Best and the Cheapest.

THE CELEBRATED CRAIK

Perspective View of Wheel.

Turbine Water Wheel.

THE ONLY WATER WHEEL IN THE WORLD THAT GIVES AS HIGH A PERCENTAGE ON PARTIAL AS ON FULL GATE.

We invite the attention of Millers and others using water power to our wheel. It is the cheapest wheel for a given power in the market, and

Is Guaranteed to Give Entire Satisfaction,

or it may be returned at our expense. It excels all others in the following points:

1. Both buckets and chutes are made of wrought iron, giving great strength to the wheel and perfect smoothness to the bucket, avoiding both breakage and loss of power from undue friction of the water in passing through the wheel.

2. From the peculiar construction and shape of the buckets, the water is concentrated on the wheel at its highest possible velocity at either full or part gate, thus giving as good a percentage at partial as at full gate, which cannot be obtained by any other wheel.

3. The chutes are cast stationary in the case, so that there is no possibility of their getting loose or leaking. At the same time the moveable gates are so constructed that the full force of the current of water is thrown by the chutes against the buckets, where it is spread out in a thin sheet when the wheel is running at part gate, thus realizing the same percentage of power as when the wheel is running at full gate.

As we wish the superiority of these wheels to be fully demonstrated to the satisfaction of every purchaser, we offer to ship them to any part of this or any foreign country, to any responsible party, at our own expense, and allow a sufficient time to prove the claim made for them, and in case of non-satisfaction will bear the expense of re-shipment.

This wheel has thoroughly demonstrated its superiority in practical use over all others, and arrangements have now been made to manufacture it under improved plans which will enable the wheel to be sold at about one-half the price of other wheels.

For Circular and Price List send to

CRAIK TURBINE MANF'G CO., La Crosse, Wis.

We also Manufacture the

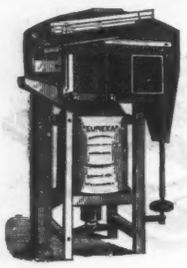
Celebrated Craik Driver for Mill Stones!

The Only Perfect Frictionless, Self-Adjusting Driver in the World.

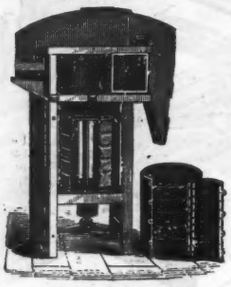
When used in connection with **CRAIK'S PATENT BAIL,** we Guarantee a Better Grade and Greater Yield of Flour with this device than with any other in the market. The change can easily be made on any kind of spindle without altering its present form, and competent men will be sent to any part of the Union to make the change, sufficient time being allowed to test its merits before paying for it.

Send for Circular. CRAIK TURBINE MANF'G CO., La Crosse, Wis.

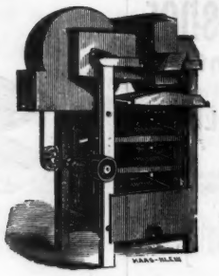
ESTABLISHED IN 1856.



THE "EUREKA" Smut and Separating Machine.



THE "EUREKA" Brush Finishing Machine.



THE "EUREKA" Separator.

THE "SILVER CREEK" Flour Packer.

We have added to our list of specialties in the line of manufactures, the "SILVER CREEK" FLOUR PACKER, which, with our full line of WHEAT CLEANING MACHINERY, we sell at greatly reduced prices. We also keep

FULL STOCKS OF THE

Genuine Dufour and Dutch Anchor Bolting Cloths.

Cloths made up on short notice in the best manner. Send for Pamphlets, Circulars, and Price Lists. Address,

Howes, Babcock & Co.,

Silver Creek, Chautauqua Co., N. Y.

IMPORTANT TO MILL-OWNERS!

It is extensively used in this and Foreign Countries!

ESTIMATES FURNISHED FREE

For Shafting, Pulleys, Hangers, and Cog Gearing, or

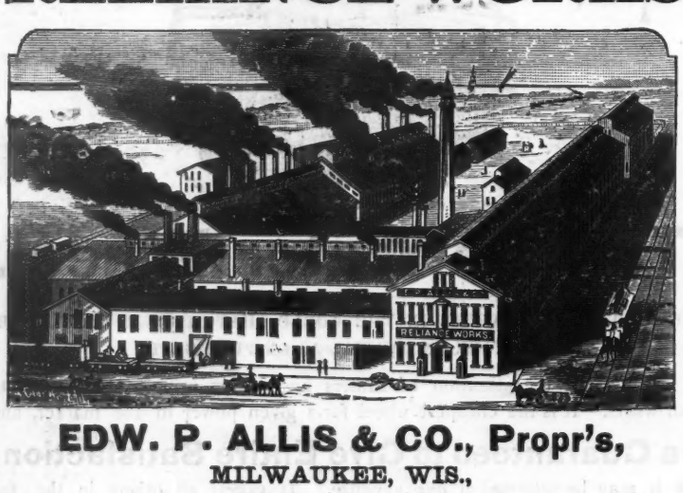
MILLS COMPLETE

22n *Office: 23 South Beaver st., York, Pa.*

The GATE IS TIGHT-SHUTTING, EASILY OPERATED, and has no Complicated Gears or Traps concealed under cover.

PAMPHLET containing REDUCED PRICES and Testimonials of Merit, also Catalogue of Milling Supplies, sent free.

RELIANCE WORKS



EDW. P. ALLIS & CO., Propr's,

MILWAUKEE, WIS.,

MILL BUILDERS AND FURNISHERS.

—SOLE MANUFACTURERS OF—

The Improved Corliss Engine,

—AND—

WEGMANN'S PATENT PORCELAIN ROLLER MILLS.

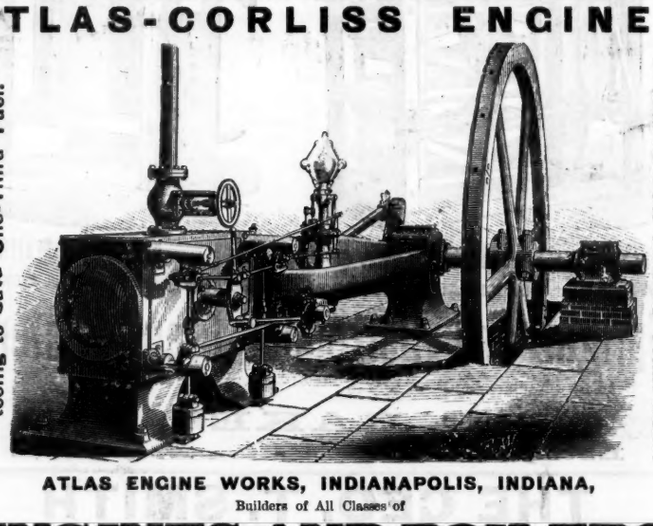
For particulars and prices, address,

EDW. P. ALLIS & CO.,

MILWAUKEE, WIS.

ATLAS-CORLISS ENGINE!

Will Replace Ordinary Engine, Guaranteeing to Save One-Third Fuel.



WRITE FOR ENGINE PAMPHLET.

ATLAS ENGINE WORKS, INDIANAPOLIS, INDIANA,

Builders of All Classes of

ENGINES AND BOILERS

We build *The Best Farm Engines and Small Engines* for Warehouses and Elevators.

ALLEN'S PATENT

AUTOMATC GRAIN WEIGHER AND REGISTER."

A New and Useful Machine for Weighing Grain in the Running Stream, and the Only Successful one Ever Invented.

One of these machines set over the hopper shows the miller the exact quantity of grain ground in an HOUR, a DAY, or a YEAR.

It is entirely automatic, requiring no attention, and is perfectly accurate; not varying five pounds—from the correct weight—in a hundred bushels.

Being made entirely of iron and steel, it is not affected by dampness; and as there are no springs or wheels or other contrivances which are likely to get out of order, it will last a long time. Those parts which are liable to wear are all made of hardened and polished steel, and will not change for years.

No miller should be without one or more and no miller WILL BE who has ever tried or seen one in operation.

They have as yet only been made in small sizes, to weigh from five to three hundred bushels an hour, but can be increased to any capacity required.

They are of small size, light and easily handled, and can be put in a very small space: a machine which will weigh and register three hundred bushels an hour occupying less than eighteen inches square.

THEY ARE SMALL, SIMPLE, DURABLE, INEXPENSIVE.

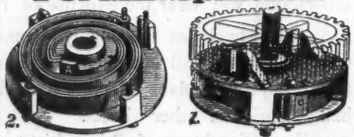
Agents wanted in every State in the Union. For further particulars, address,

DR. WM. H. ALLEN,
5 23w26 No. 18 West 11th St., N. Y. City.

THE CELEBRATED

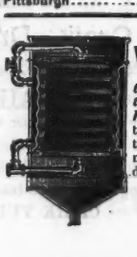
EUREKA COIL SPRING

For Mill Spindles.



The only Spring ever awarded Centennial and Gold Medals. This is the Spring of which D. R. Sparks, President Illinois Millers' Association, says: "We are only sorry that we did not get them at first." Does not cure but prevents backlash. Address

JOHN A. HAFNER, 39 Water St.,
Pittsburgh.....Pennsylvania.



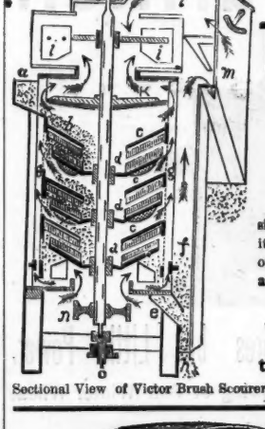
Gratiot's Improved

WHEAT HEATER!

thoroughly and properly toughens the bran on the *hardest* or *driest* wheat; heats the wheat *evenly*, and improves the flour and milling generally, as no other Heater in the market does. Send for Circular,

GRATIOT BROS.,
Platteville, Wis.

HAVE YOU EXAMINED



Sectional View of Victor Brush Scourer.

The Victor Brush Scourer?

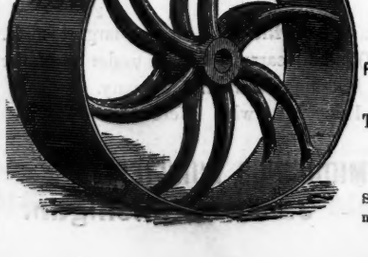
Made by the

Barnard & Leas Manufacturing Company, Moline, Illinois.

If not, send for Illustrated Circular, giving full description, price, size, etc., as it is the *Latest and Best Brush Scourer out. Try* it and you will say so yourselves. They are also the sole manufacturer of the **Victor Smutter, Barnard's Dustless Wheat Separators,** and **Oat and Weed Extractors,** and the unrivalled **Eureka Flour Packers.**

We guarantee all these Machines and give time for Trial.

apt14tf



Shafting, Pulleys, Hangers, Couplings, Elevator and Mill Machinery.

MILL FURNISHERS

AND

MILL BUILDERS.

Pulleys from 3 to 100 inches in Diameter.
Pulleys made in Halves.

Transmission of Power by Wire Rope, etc.

WILLIAMS & ORTON MF'G CO.,
STERLING ILL.,

Send for Reduced Price List and Treatise on Transmission of Power by Wire Rope.